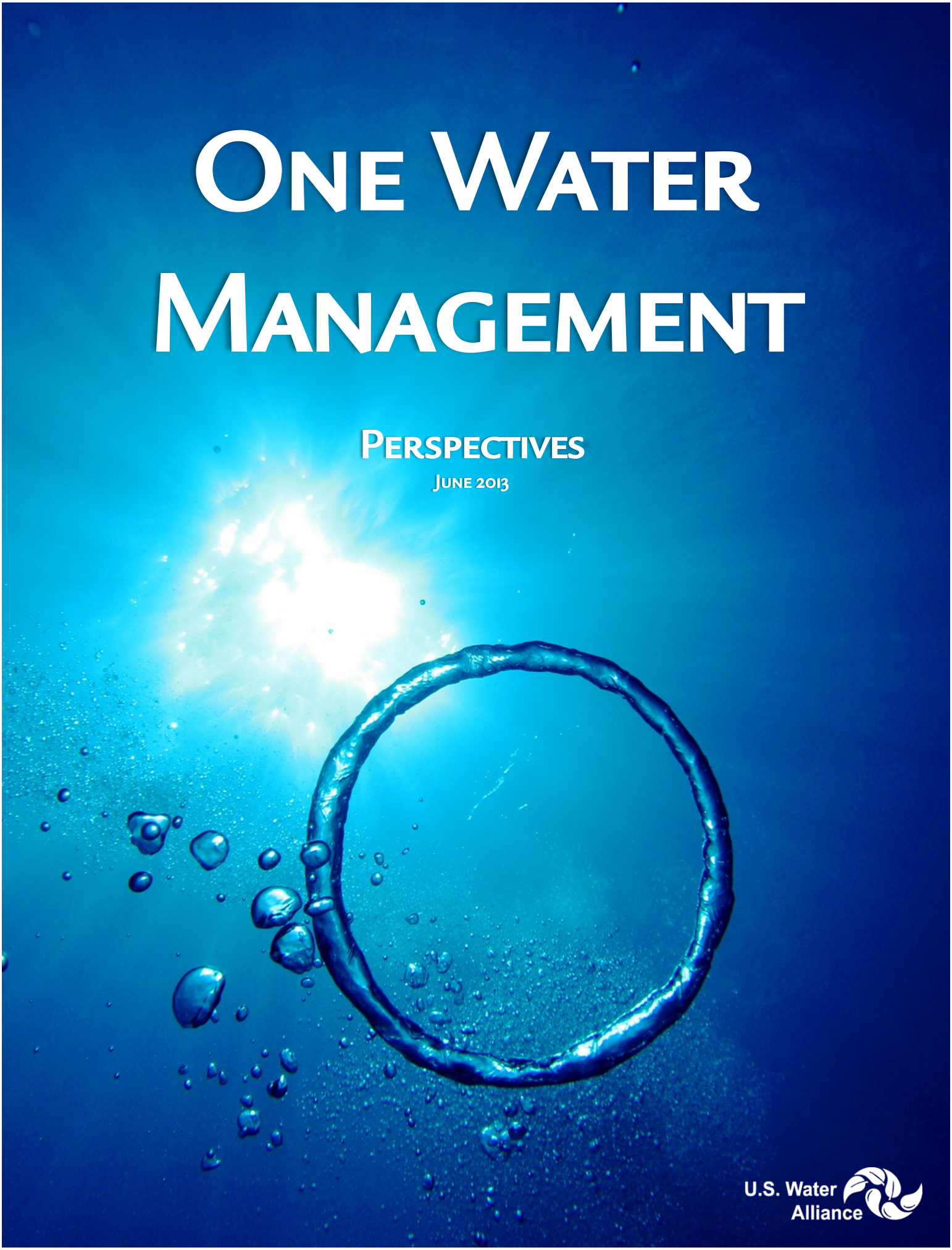
One Water Management

Perspectives

June 2013



U.S. Water Alliance

June 20, 2013

Dear Colleagues:

Launched in 2008, the Alliance, a 501(c)(3) educational nonprofit, was created as a national forum to unite people and policies for water sustainability. Over the last four years, the Alliance has convened summits and workshops, administered a U.S. Water Prize competition, issued reports, conducted webinars, and facilitated meetings to help advance a new generation of integrated and sustainable water management systems. Shifting from a culture of conflict to one of collaboration, the Alliance has sought to bring together leaders in the drinking water, wastewater, stormwater, water reuse, water resources and watershed management fields with counterparts in the agricultural, industrial, environmental, transportation, parks, energy, and finance areas.

One Water Management Network

In 2012, with the support of the Water Environment Research Foundation (WERF), the Alliance convened a meeting among federal, state and regional level water stakeholders. Water leaders shared their perspectives on OWM and talked about how we might collaborate to advance thinking and a policy framework for sustainable integrated water management. The meeting was historic in the array of water interests represented and the growing numbers of voices supporting an OWM approach. Following the meeting, more than a dozen organizations signed a Statement of Collaboration, agreeing to collaborate as an OWM Network to advance understanding, share solutions, and identify research and policy priorities.

In 2013, with the support of WERF, the Water Research Foundation and the WateReuse Research Foundation , the Alliance is convening a second meeting (June 20 2013) to expand the Network and develop a specific action plan for further collaboration. Membership in the Network continues to grow. As of June, members include:

Alliance for Water Efficiency
American Public Works Association
American Rivers
American Water Resources Association
Association of Clean Water Administrators
Association of State Drinking Water Administrators
Delaware River Basin Commission
National Association of Clean Water Agencies
National Association of Water Companies
National Ground Water Association
National Ground Water Association
National Onsite Wastewater Recycling Association
The Pacific Institute
U.S. Water Alliance
Water Environment Research Foundation
Water Research Foundation
WateReuse Association
WateReuse Research Foundation
Western Coalition of Arid States

Sincerely,

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Submitted by: Mary Ann Dickinson, President and CEO, Alliance for Water Efficiency, MaryAnn@a4we.org

The Alliance for Water Efficiency was formed in 2007 for the purpose of promoting the efficient and sustainable use of water. A 501(c)(3) non-profit organization, AWE serves as a voice for the long-term protection and wise use of water resources, especially drinking water resources. Headquartered in Chicago, AWE focuses on water efficiency programs and practices primarily in the US and Canada. However, we also work in other parts of the world, including Australia, Jordan, Italy, and the Philippines. We are governed by a Board of Directors representing water utilities, industry, local and state government, academia, environmental and energy advocacy, planning agencies, plumbing manufacturers, and retail distributors. The breadth of these perspectives helps define the role and mission of the organization.

While the public has been aware of the need for energy efficiency for the past three decades, they are not generally aware of the importance of the same programs in water. Water efficiency programs are more prominent in desert and desert-like arid regions (such as Las Vegas and Los Angeles) but less prominent in historically water-rich regions, such as the Pacific Northwest, the Great Lakes and the southeastern U.S. While conserving water seems less obvious in regions that are perceived as "water rich," it is no less important or economically beneficial to water utility systems in those regions. For this reason, AWE focuses its outreach on where water conservation can provide demonstrable benefits to water supplies and reliability, consumers, and the environment.

AWE is particularly interested in integrating water efficiency into a broader palette of water resources planning. A planning model called the *Water Conservation Tracking Tool* has been built to evaluate the cost-effectiveness of conservation programs, and this widely used tool can be seamlessly incorporated in community integrated water resources plans. We think of efficiency as one of the necessary planks in the water resources portfolio, a portfolio which should include water quality and storm water management as well as water supply and wastewater treatment. AWE also focuses on linking water and energy, showcasing how reducing water use reduces energy and greenhouse gas emissions. The *Water Conservation Tracking Tool* also does this analysis.

Websites. AWE has two websites. Its regular website (www.allianceforwaterefficiency.org) provides a comprehensive resource library of programs and documents, breaking news items, events, white papers, the "Water Efficiency Watch" newsletter, and a "Legislative Watch" information page. Its second website (www.home-water-works.org) is a consumer web site with information on wise water use in the home and featuring a graphically appealing and fun home water calculator.

Technical Assistance. AWE provides guidance on planning consumer water conservation programs as well as information on evolving technologies and practices, such as using high-efficiency plumbing and irrigation products; developing water budgets; incorporating efficiency in residential and commercial buildings; designing conservation rates and equitable customer billing; and reducing network leakage. The Resource Library on AWE website contains an ever-growing library of research, program and policy information. It is an authoritative source of water efficiency information.

Other Activities. Training workshops, water efficiency research, representation at codes, standards, and green building specification committees, and managing the Plumbing Efficiency Research Coalition.

Washington Office
1275 K St., NW, Suite 750
Washington, DC 20005
202-408-9541/Fax 202-408-9542

The American Public Works Association (APWA) serves professionals in all aspects of public works. With a worldwide membership over 28,000 strong, APWA includes not only personnel from local, county, state/province, and federal agencies, but also private sector personnel who supply products and services to those professionals. As a comprehensive public works resource, APWA continues in its rich tradition of making a difference both on an individual and professional level. APWA is a not-for-profit, 501 (c) (3) organization that prides itself on its ability to provide varied educational and networking opportunities that help public works personnel to grow in their professionalism and directly impact the quality of life in all the communities they serve.

Clean Water Policy Statement of Position
APWA is committed to protecting and improving water quality. APWA believes that goal can be achieved by following the sound principles of: Reliance on Sound Science, Watershed Planning and Management, Priority Setting, Financing to Meet Water Quality Needs, Research, and Effective Management and Infrastructure Sustainability.

Watershed Approach to Water Quality with All Key Stakeholders Statement of Position
The APWA supports a holistic watershed approach to water resources management – where all key stakeholders, including agricultural, commercial, industrial, recreational and municipal service providers, do their proportionate share to prevent and reduce impacts in their common watershed – as an effective and comprehensive means of meeting the goals of preserving the quality of the nation's waters. The goal of a watershed approach is to manage to the "triple bottom line" defined as, environmentally sustainable, economically feasible and enhances the quality of life.

Guiding Principles
APWA believes that an effective watershed approach addresses problem prevention in addition to problem solution and must be guided by the following principles:

- **Involvement of Key Stakeholders** – key stakeholders in a watershed are identified early in the planning process and are provided an opportunity to participate meaningfully. Failure to do so undermines the process, as well as the results at the conclusion of the process.
- **Watershed Based Permitting** – the goals identified in managing our watersheds to the triple bottom cannot be achieved without restructuring at the federal level to allow for watershed based permitting.
- **Pollution Prevention at the Source** – the best management practice is to recognize and prevent a potential source of pollution before it occurs. Prevention is more cost-effective in the long run than cleanup or treatment, and it should be emphasized first in any common watershed approach.
  Proportionate Share – all sources of pollution in a watershed should do their proportional share to reduce or eliminate pollution. Local govts shouldn't be forced by regulatory authorities to clean up more than they contribute.
- **Local Land-Use Decision Making** – land use management is a tool that local communities may use to address watershed concerns. However, if the stakeholder effort fails to bring consensus, regulatory authorities should not be granted the authority to make land-use decisions for the local community. Land-use decisions must remain local.
- **Streamlining Regulatory Processes and Redirecting Resources** – Comprehensive watershed management can be accomplished by reexamining regulatory priorities, streamlining regulatory processes, and redirecting federal, state and local resources. The watershed approach should not be another layer of bureaucracy, but a true alternative to the current regulatory approach.
- **Incentives for Participation** – a watershed approach has a greater chance of success if real incentives are provided to the key stakeholders for their participation. These could include a commitment of additional time to achieve water quality standards, streamlining permit processes, pollutant trading, priority consideration for Clean Water Act grants, or prioritization of available agricultural conservation funds within the watershed.
- **Coordinated Activities Over Time** -- the watershed approach encourages a management cycle to lay out long-term plans for assessing, maintaining, restoring and protecting water resources. This cycle supports sustainable, cost-

AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

Submitted by: Nancy C. Somerville, Hon. ASLA, Executive Vice President and Chief Executive Officer

The more than 15,000 members of the American Society of Landscape Architects (ASLA) are national leaders in designing and planning innovative water infrastructure projects that use nature and mimic natural systems to sustainably and cost-effectively manage stormwater.

Key Actions

- Co-authored landmark national green infrastructure report entitled "*Banking on Green: A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits Community-wide."*
- Collected 479 case studies on green infrastructure best practices from 43 states, the District of Columbia, and Canada.
- Serve on a coalition that supports EPA efforts to promulgate a national stormwater rule.
- Works with key members of Congress on introducing and supporting legislation that will promote the use of green infrastructure to manage stormwater runoff and address key water quality and quantity issues across the country.
- Co-sponsored the first annual EPA CampusRainworks Design Competition that awarded prize money and research grants for innovative designs and master plans to sustainably manage water on campuses.
- Co-founder of the Sustainable Sites Initiative™ (SITES™), the first national guidelines and rating system for sustainable land planning, design, construction, and maintenance practices. The pilot phase of SITES, based on the 2009 *Guidelines and Performance Benchmarks,* concluded last year. *SITES v2* will be finalized and released in the fall of 2013, at which time open enrollment will be available for any project to pursue certification. www.sustainablesites.org

Key Resources:

- www.asla.org/stormwater houses 479 green infrastructure case studies and Banking on Green Report.
- ASLA's Designing our Future: Sustainable Landscapes case studies demonstrate how well-designed sites can solve a host of issues while creating and adding value to the surrounding community. www.asla.org/sustainablelandscapes
- ASLA's Designing Our Future: Sustainable Landscapes animations are designed to be a basic introduction to sustainable design concepts, created for the general public and students of all ages. Of particular interest: Leveraging the Landscape to Manage Water animation. www.asla.org/sustainablelandscapes
- ASLA's award-winning green roof and green roof website. This living laboratory shows how green roofs can absorb stomwater, help reduce energy costs, and provide valuable habitat in an urban setting. www.asla.org/greenroof

AMERICAN WATER RESOURCES ASSOCIATION

Community, Conversation, Connections

Submitted by: Ari Michelsen, Past President, American Water Resources Association, amichelsen@ag.tamu.edu

AWRA has been and continues to be a leader in developing and facilitating advancements in the process, technical capacity, and policies for implementation of Integrated Water Resources Management (IWRM). Examples of AWRA's actions and activities in IWRM include:

- Adoption/approval of a position statement January 2011 recommending that water management goals, policies, programs and plans be organized around the concept of IWRM, principles for success and stating AWRA's commitment to furthering implementation of IWRM (see *http://www.awra.org/policy-statements.html*);

- Organizing and convening an international Specialty Conference dedicated to IWRM in 2011 titled "The Emperor's New Clothes or Indispensable Process?" chaired by 2011 President Michael Campana. An important part of the conference was a full-day symposium on "Collaborative Modeling as a Tool to Implement IWRM."

- Partnering and collaborating with other national and international organizations and agencies such as ICIWaRM, USACE, UCOWR, EWRI and TNC over many years to increase understanding of the need, technical and institutional requirements and benefits, and development of tools, concepts and skills for advancing implementation of IWRM;

- Sponsoring and holding numerous technical conference sessions on IWRM issues over the past ten years;

- Conducting a large scale survey of water professionals across a wide range of disciplines and several associations on the role, importance and training needs for IWRM (2006); and

- Having AWRA selected to serve as Chair of the IWRM Priority Area for the 6th World Water Forum with eight IWRM Tagets and sessions in Marseille, France, March 12-17, 2012.

- In 2012 AWRA issued a publication entitled Case Studies in Integrated Water Resources Management from Local Stewardship to National Vision: http://www.awra.org/committees/AWRA-Case-Studies-IWRM.pdf

- We have conducted a series of six webinars on Integrated Water Resources Management in 2013 the contents of which are at our website: www.awra.org

- In 2012 AWRA initiated an award entitled the Outstanding Integrated Water Resources Management Award which recognizes outstanding IWRM teamwork on a project in consulting, government, nonprofit, or academia.

- AWRA will conduct its second International Specialty Conference on Integrated Water Resources Management June 30-July 2, 2014 in Reno, Nevada, chaired by AWRA board member, John Tracy, Director of the Idaho Water Resources Research Institute in Boise, Idaho.

AWRA recognizes that Integrated Water Resources Management is not new and is more than just a buzz phrase. IWRM is being implemented and is making a positive difference worldwide. In 1992 the International Conference on Water and the Environment's "Dublin Statement" called for governments to assess their capacity to implement IWRM. And in 2002 the World Summit in Johannesburg took another step calling for all countries to establish IWRM plans. A widely accepted definition of IWRM developed by the Global Water Partnership (2000) is: "IWRM is a process that promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare without compromising the sustainability of ecosystems and the environment. Operationally, IWRM approaches involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable and sustainable solutions to water and development problems." It is important to note a key word, "sustainability", is in the established definition of IWRM and that IWRM is applicable at a wide range of scales including all water sources and uses, from local community to watershed, river basin, to interstate and internationally.

IWRM is and requires a multidisciplinary approach and process and AWRA and our members in private industry, government and academia are the leaders in advancing multidisciplinary, integrated water resources management. As demon-

Association of California Water Agencies
Since 1910
Leadership • Advocacy • Information • Service

The Association of California Water Agencies (ACWA) is the largest statewide coalition of public water agencies in the country. Its nearly 440 public agency members collectively are responsible for 90% of the water delivered to cities, farms and businesses in California.

A Proud History, a Clear Mission

Formed in 1910 by five irrigation districts and originally known as the Irrigation Districts Association (IDA), members voted in 1973 to rename the group the Association of California Water Agencies to better reflect its changing role in California. The Association's mission is to assist its members in promoting the development, management and reasonable beneficial use of good quality water at the lowest practical cost in an environmentally balanced manner.

Investing in a Sustainable Water Future

The Association has taken a strong policy position to support comprehensive solutions to California's water problems. In 2005, a major water policy document was released, titled "No Time to Waste: A Blueprint for California Water," which called for a comprehensive suite of investments and actions to ensure the state has the water supply system it will need in the coming decades. These investments and actions, including improvements in water storage capacity and the way water is conveyed through the Sacramento-San Joaquin River Delta, are needed to allow California to meet the co-equal goals of environmental health and a reliable water supply.
In addition, the Blueprint called for investments in local resource development strategies such as water use efficiency, water recycling, groundwater storage and desalination.

Policy Principles to Meet the Co-Equal Goals

The Association's Board of Directors has adopted policy principles on a number of key topics to help guide the association's efforts on legislative and regulatory issues. The principles are available at acwa.com.

- Policy Principles for Improved Management of California's Headwaters
- ESA Implementation Policy Principles
- Climate Change Policy Principles
- Water Infrastructure Financing Principles
- Eminent Domain Policy Principles
- Integrated Regional Water Management Plan Grant Program Principles
- Environmental and Economic Sustainability Principles
- Water-Energy Legislative Policy Principles
- Groundwater Management Policy Principles
- Delta Governance Policy Principles
- Delta Conveyance Policy Principles
- Water Conservation Policy Principles
- Desalination Policy Principles
- Delta Vision Policy Statement

ACWA released a major policy document on groundwater management in April 2011. The document, "Sustainability from the Ground Up: A Framework for Groundwater Management in California," provides an in-depth look at current efforts to manage groundwater basins in California and recommends proactive steps to advance sustainable management.

Submitted by: Alexandra Dapolito Dunn, Executive Director & General Counsel, Association of Clean Water Administrators, adunn@acwa-us.org

The Association of Clean Water Administrators (ACWA) is the national, independent, nonpartisan, voice of state, interstate, and territorial officials responsible for daily implementation of the Clean Water Act (CWA). The nature of ACWA's work over the years has consistently furthered the specific interests of the federal/state partnership in developing and implementing water quality protection programs. ACWA's approach directly aligns with Integrated Water Resources Management (IWRM). Notably, our interstate agencies have unique experience with complex watershed management issues. Examples of ACWA's recent watershed-based work are listed below.

- ACWA launched a Water Resources Management Committee (WRMC), evolving out of a previous Climate Adaptation Committee. The WRMC hosts regular calls on water resources management topics, including a recent presentation by the USGS Advisory Committee on Watershed Information (ACWI) on the efforts of ACWI's Water Resources Adaptation to Climate Change Workgroup and its USGS Monitoring Challenges Team. The WRMC works to support collaboration in these efforts by sharing knowledge with states and providing feedback on federal efforts such as ACWI.

- ACWA's WRMC Co-Chairs and Association staff participate on EPA's State Tribal Climate Change Counil (STC3), as well as on the STC3 Steering Committee. The STC3 focuses on climate change, weather disruption, adaptation, and other challenges for clean water and drinking water programs, with a goal of encouraging and enhancing communication between State, Tribal, and EPA water program managers. The STC3 held several calls regarding EPA Office of Water's 2012 Climate Strategy. ACWA focuses on sharing information with its WRM Committee to advance awareness of climate and watershed related activities.

- ACWA participates in both an EPA-State Collaboration and the Source Water Collaborative focused on leveraging CWA and Safe Drinking Water Act (SDWA) tools to protect water sources. The CWA/SDWA collaborations have held regular workgroup meetings, presented initial results to EPA Water Division Directors and Office of Water, and are working to develop guides for states to leverage existing tools and identify new opportunities for protection between state CWA and SDWA agencies and regulators.

> The complexity of water quality issues associated with today's challenges requires more collaboration than ever. ACWA's mission, daily work, and relationships and interactions with numerous stakeholders fully support a holistic watershed approach, ultimately striving to provide "clean water everywhere for everyone."

- ACWA signed a Memorandum of Understanding (MOU) with The Nature Conservancy and EPA in support of EPA's Healthy Watersheds Initiative (HWI). The MOU formalizes a relationship between EPA, ACWA, and the Conservancy to facilitate the development and implementation of HWI programs in states and regional aquatic ecosystems. EPA's HWI is a voluntary initiative whose key elements include working with state and other partners to identify healthy watersheds state-wide and to develop and implement healthy watershed protection plans, to integrate such protection into EPA programs, and to increase awareness and understanding of the importance of protecting our remaining healthy watersheds.

- ACWA works with EPA and other Partners to promote green infrastructure (GI) as an environmentally viable approach to holistic stormwater management. GI is focused on stormwater management and retention, which address stormwater pollution concerns, flood mitigation, and other watershed-wide issues. ACWA and the other GI Partners work to expand the GI applications and knowledge, and to identifying and remove GI barriers.

ACWA is a part of EPA's sustainable utility and integrated planning initiatives, which also focus on holistic watershed and integrated approaches.

ASDWA

Association of State Drinking Water Administrators

The Association of State Drinking Water Administrators (ASDWA) represents the collective interests of the 50 states, five territories, the District of Columbia, and the Navajo Nation in their efforts to provide safe drinking water for the citizens of the United States.

The principal mission of state drinking water administrators is protecting the public health of Americans by working -- in concert with our partners in the water utility community and third party technical assistance providers – to ensure safe water at the tap. This charge involves, among other tasks, ensuring that Federal drinking water regulations governing some 90+ contaminants (and any more stringent state requirements) are complied with. The most appropriate and cost-effective way to accomplish this objective is, we believe, a one water management approach which includes protection of sources of drinking water and wise stewardship of the resource, in addition to treatment applied at the water utility. Approaches in which most of the burden is placed on the drinking water utility to remove contaminants of concern -- without the benefit of upstream (or up-gradient) protective strategies for surface and ground water sources – are, we believe, far less effective and more expensive.

It has also become increasingly apparent that water quantity and quality are flip sides of the same coin. Water shortages in many parts of the country in recent years (including in those areas once thought to be "water-rich" and immune from such worries) has meant, in some cases, that lesser quality sources needed to be tapped to keep up with demand – with concomitant treatment challenges and energy demands. It has also become very clear that these various considerations ally closely with a host of related concepts, such as wise use of energy, water reuse, water conservation, community resiliency, and community sustainability.

An appropriate banner (in our view), under which to rally, is integrated water resources management – or, in short, one water management. While the term means different things to different people, most agree that it refers to a thoughtful, holistic approach that tries take all of relevant water resource management considerations (quality, quantity, energy, economics, social benefits, etc.) into account at the same time – and which employs tools and approaches to make that possible. We believe an exciting recent development is the availability of a host of tools, models, techniques, practices – and partners -- that make it easier to routinely apply these various approaches in a meaningful way by a variety of practitioners. This is especially important in the resource-constrained world in which we work. Some of the activities we have underway in an effort to support one water management concepts include the following:

- Communicating frequently with state drinking water administrators -- through meetings, workshops, conferences, and daily communications – to be sure that states are aware of the latest tools and information relative to one water management concepts.

- Working with partner organizations, particularly those charged with implementing the Clean Water Act and in the agricultural community to seek "win-wins" – that both accomplish their missions and objectives as well as protect sources of drinking water.

- Supporting states in their efforts to be well positioned relative to water availability, sustainability, and variability; including sharing information developed by Federal, other state, and local partners relative to water availability.

CANADIAN WATER NETWORK
RÉSEAU CANADIEN DE L'EAU

www.cwn-rce.ca

Established in 2001 and headquartered in Waterloo, Ontario, the Canadian Water Network (CWN) is a non-profit corporation driving Canada's progress on core water management challenges. CWN enables Canada to address the big picture and challenge traditional thinking surrounding water. This leads to the development of robust solutions that address multiple needs and are appropriate to regional realities.

Canadian Water Network's decade of experience has led to its critical intermediary role of bringing together key decision-makers to determine shared water management needs across municipalities, industry and governments from local to national. We then find the right research partners to address those needs, ensuring that the right combinations of knowledge yield tangible results.

Collaboration and Knowledge Mobilization are rooted in our Consortium research model. Our approach ensures that end-users capture the value of academic research capacity in Canada in three areas of focus. The Canadian Municipal Water Consortium focuses on Canada's capacity to develop better and more efficient policy and practice in managing municipal water supplies.

The Secure Source Waters Consortium seeks to better integrate the needs of water managers within watersheds with those managing related aspects of down stream water sources accessed for a variety of uses to improve benefits for all.

The Canadian Watershed Research Consortium supports science-based decision-making to develop a common framework for cumulative effects assessment and determines the impact of the stressors in watersheds across the country.

CWN initiatives have spanned more than 130 multidisciplinary research projects, focusing the expertise of more than 200 researchers and 200 students across 37 Canadian universities with that of more than 350 partners in industry, government and non-governmental organizations. Since its inception in 2001, CWN has invested more than $50 million dollars to advance the research being done to develop more resilient, adaptive systems and frameworks to deal with the uncertainty and risks related to water.

THE CONSERVATION FUND

Submitted by Joseph Hankins, Vice President, The Conservation Fund. jhankins@conservationfund.org

The Conservation Fund, working with public, private and nonprofit partners, protects America's legacy of land and water resources through land acquisition, sustainable community and economic development, and leadership training, emphasizing the integration of economic and environmental goals. The mission of TCF has always been land and water conservation. TCF has completed nearly 650 real estate projects, conserving over 750,000 acres valued at $1.1 billion that directly benefit river corridors, watersheds, coastal wetlands and water-based recreation. Water has historically driven public attention and investment in conservation. The American public consistently ranks safe drinking water and water supply protection as the top concerns and the highest justification for investments in environmental protection.

TCF has a strong perspective on the integration of landscape scale conservation – forests, working lands, and other natural areas – with water protection to benefit multiple uses. TCF's State of the Chesapeake Forest report stressed source water protection for drinking water for 11 million people of 17 million living in 64,000 square mile Chesapeake watershed and spotlighted the inseparable relationship of land use/land protection to water as measured by Bay water quality, health of aquatic living resources, and livability for human communities in watershed.

We are working through the GreenSeams program in Milwaukee, and in green infrastructure planning projects in Nashville, Chicago, Houston and Los Angeles where metro water resources are at the center of our work to shape more sustainable, growing communities.

Climate adaptation is all about water. As US coasts and waterfronts attract an increasing percentage of the nation's growing population we are challenged to resolve excessive development and development in the wrong places. We are underinvested in flood and storm water protection generally and deficient in approaches that will stand up to increased demands imposed by a dynamic climate. Instead of designing with nature and using natural infrastructure elements such as productive wetlands, functioning dune systems, and intact floodplains, too often we depend on structural approaches that are expensive to build and maintain and still fail to provide the resiliency of nature to extreme events.

Water is also fundamental to our efforts to protect working landscapes, in particular agricultural lands that support rural economies and create American food security. Competition for water resources for energy extraction and production, for supporting ecological systems, and for urban development threaten our global role in feeding ourselves and feeding dependent billions more around the globe. We work to develop water efficient technologies for sustainable food production systems, implement practices that restore and mitigate water quality impairments and encourage investments in natural resource-based businesses that value clean water assets.

In our work across the country it is clear that water, and the integrated planning and management of water resources, is a critical priority. The Conservation Fund is committed to advance efforts and seek partnerships in this important cause.

Council for Watershed Health

Submitted by Nancy L.C. Steele, Executive Director, Council for Watershed Health, nancy@watershedhealth.org

The Council for Watershed Health supports healthy watersheds by serving as a robust center for the generation of objective research and analysis. The Council provides a platform for meaningful collaboration between governmental agencies, academic institutions, businesses, and nonprofit organizations with a vested interest in preserving the watershed. Our trustworthy expertise and ongoing programs connect a diverse set of stakeholders in an effort to drive polices that will continually improve watershed quality.

The mission of the Council for Watershed Health is to facilitate an inclusive consensus process to enhance the economic, social, and ecological health of the region's watersheds through education, research, and planning. We promote a vision of sustainable watershed management, with urban watersheds managed for environmental health, social equity, and economic vitality. Vision 2025 calls for clean waters, reliable local water supplies, restored native habitats, ample parks and open spaces, integrated flood management, revitalized rivers, and vibrant urban centers.

The Council actively promotes IWRM through its use of the "watershed approach" to guide its work and its leadership in the region's Integrated Regional Water Management Group. Our work considers the effect of landscape-level changes on the watershed and seeks to incorporate multiple benefits in projects, including improvements in water quality, water supply, recreation, and habitat. Maintaining healthy watersheds provide clean water and habitat for people and wildlife, a healthy environment, and a strong economy.

The Greater Los Angeles County IRWM Group set ambitious goals and objectives to ensure the delivery of clean and reliable water, integrating water supply, water quality, flood management, and open space strategies. The Group is currently updating its 2006 Plan with new information and future projections of the region's needs, which will inform California's Water Plan.

Achieving regional sustainability through integrated natural resources management. The Council's research and monitoring programs center on the goals of improving and expanding local water supplies, reducing per capita water demand in the greater Los Angeles region, and improving understanding of trends related to the health of watersheds and communities through tracking and assessment of indicators of watershed health.

Changing policies and practices through strategic actions and communication. The Council is a leader in providing resources for the water/watershed community. The Council's website (www.watershedhealth.org) highlights the latest events, research, news and jobs. Our events (Watershed Symposia and Conferences, Environmental Funders and Media Forum and Sustainable Landscape Seminars) bring together leaders in the field to discuss important issues of the day, promote good watershed management to policy makers, train professionals in water saving best-practices and continue the dialogue.

Working together, we can achieve the vision. The Council strives to be a leader among leaders, working with government, business, academia, and organizations to maintain and improve capacity in the sector to ensure the success of Vision 2025.

InSinkErator's Perspective on One Water

InSinkErator is the world's leading manufacturer of food waste disposers (both residential and commercial). Invented 75 years ago for the purpose of creating convenience in a home's kitchen, disposers allow for the immediate disposal of food scraps via a grinder under the kitchen sink that pulverizes food scraps into a slurry for easy transport through existing underground waste lines to municipal wastewater treatment facilities.

While convenience, hygiene and public health remain the hallmarks of the popularity of food waste disposers In U.S. homes – an estimated 60 million installed, with growing international interest and acceptance, **four big ideas** form the basis for reconsideration of food waste disposers as an essential and compelling environmental management tool.

First, food waste is increasingly understood to be a compelling environmental issue. Recent studies estimate that as much as 40% of food that is produced is wasted at various stages along the production, distribution and consumption chain – with a significant portion occurring at the consumer level. Inherently, food represents significant resource investment – water, energy for transport and processing, and when wasted, the potential for creating methane, which is 20 times more potent than carbon dioxide as a contributor to global warming. Organic material extracted from soil to produce food also needs to be returned to replenish agricultural soil.

To attack this challenge, municipalities and other generators are using a growing array of tools, systems and programs, including curbside collection (via truck) programs for delivering food scraps to compost facilities, as well as encouraging backyard composting (where possible). Systems to divert wasted food to feed hungry people also are being re-thought and expanded.

Second, food is primarily water. Although wasted food is conventionally managed through the solid waste system, e.g., collection via trucks at individual homes and businesses for transport to distant landfills or incinerators, understanding the simple fact that food averages 70% water unlocks consideration of additional methods for its management as a liquid resource.

Third, modern water resource recovery centers (previously known as wastewater treatment plants, or publicly-owned treatment works, or sewage treatment facilities) are fully capable of recovering the resources inherent in both human waste and food scraps – producing clean water, biogas and fertilizer products (biosolids), with nearly zero waste. Indeed, progressive centers are becoming expert in soliciting and receiving food scraps that meet digester-ready specifications, principally from commercial, institutional and industrial generators. These "utilities of the future" understand that their capabilities can be adapted to meet this challenge – returning wasted food to the environment from which it came.

Fourth, food waste disposers – and related systems – can now be regarded as feedstock preparation devices, deployed and used for the purposes of diverting food scraps from solid waste management systems and processing that material as a liquid resource. This method may be especially compelling as the modern world becomes increasingly urbanized, with people living in high-rise multi-family buildings.

With respect to "one water," when properly utilized food waste disposers effectively divert the embedded water and nutrients in food scraps to the system best equipped to receive, process, and return it to receiving waters, and enable that system to more fully achieve its capabilities of both producing renewable energy and recovering essential nutrients for return to soil.

Drafted by **Kendall Christiansen**, Principal of **Gaia Strategies**, and senior consultant to **InSinkErator**. More information can be found at www.insinkerator.com/green.

Delaware River Basin Commission
DELAWARE · NEW JERSEY
PENNSYLVANIA · NEW YORK
UNITED STATES OF AMERICA

Submitted by: Carol R. Collier, Executive Director, Delaware River Basin Commission, Carol.Collier@drbc.state.nj.us

The Delaware River Basin Commission was created in 1961. The purpose of the Commission is to manage the water resources of the basin without regard to political boundaries. The five members are the Governors of the four basin states – Delaware, New Jersey, New York and Pennsylvania, and an officer in the U.S. Army Corps of Engineers who represents the President and all federal agencies. Even though it is a relatively small watershed (13,539 miles^2), it provides water to over 15 million people including residents and businesses in the New York City and Philadelphia metropolitan areas. It also serves as an incredible recreational resource in the densely populated Mid-Atlantic area.

The Commission is an excellent example of IWRM in action. From a technical side, it has authority for planning, development, operation, and regulation covering both water quality and quantity. It is responsible for equitable allocation of water among the states and improving water quality as well as drought management and flood mitigation. The Commission also practices IWRM through governmental integration. It is a forum for adaptation and engages multiple levels of government, as well as many stakeholders in decision making.

It has not always been easy. The DRBC is involved with a number of controversial issues including modifications to a Supreme Court Decree affecting river flow and reservoir releases in support of water supply for over 15 million people, ecological flows, flood mitigation and reducing salt water encroachment. Other issues involve reduction of PCB loads in the estuary and protection of high quality water in the non-tidal river (the longest stretch of anti-degradation waters in the nation). Currently, our biggest challenge is regulation of natural gas development in shales underlying the headwaters of the basin and addressing the potential impacts to water resources.

Much progress has been made, but it is a never ending challenge. Water resource management is always changing due to natural forces, scientific discoveries, new analytical detection limits as well as human interests and priorities. The Basin Commission must be agile and adaptive. We are currently developing a “Strategy for a Sustainable Future Water Supply”, evaluating the combined forces of change including climate variability, sea level rise, increased water demand from energy generation, changes in population and distribution, and increased requirements for ecological flows; developing alternative scenarios and potential responses.

DRBC has succeeded because it is a forum for adaptation and engages many stakeholders. The Commissioners have used DRBC as a means to modify programs, policies, and operating rules to adjust to change. This has been most apparent in the many revisions made to reservoir release programs to meet changing multi party needs. It is an organization that brings people together to solve ever changing, ever challenging water resources problems.

Note: Carol Collier is also President of the American Water Resources Association (AWRA), which has been a leader in the field of IWRM.

International Water Association

The **International Water Association** (IWA) is a non-profit organization that covers all facets of the water cycle. The group's mission is to serve as a worldwide network for water professionals and to advancing standards and best practices in sustainable water management. The association has over 10,000 individual, student, corporate, and governing members from approximately 80 countries. IWA provides information services on all aspects of water, wastewater and related environmental fields. The publishing program includes Water21 and a broad range of journals, books, research reports, manuals of best practice, and online services. IWA annually hosts more than 40 specialist conferences on various aspects of water management. IWA **Cities of the Future program** focuses on water security for the world's cities and how the design of cities – and the water management, treatment and delivery systems that serve them – could be harmonized and re-engineered to minimize the use of scarce natural resources. It relies on support from the many specialist groups within IWA.

Activities of Cities of the Future– *Engineering of Integrated Urban Water Management Systems* –To achieve significant increases in reuse, energy recovery and resource recovery, as well as heightened system resilience to climate change, water systems may need to be redesigned. Specialists in treatment, network and drainage design are working together to conceptualize new and integrated approaches to system design, both in a retrofit and a greenfield context. Includes Integrated Treatment, Smart Networks and Sustainable Urban Drainage working groups.

Water Smart City Planning, Codes and Associated Community, Developer and Institutional Interfaces Water systems and related engineering exist in the narrow context of multiple utilities and in the broader context of city-level objectives, city planning, building codes and their interfaces with the community, developers and state and national level authorities. Includes working groups on Planning Interfaces and Transitioning. Discussion papers on planning principles and water/energy nexus on the CoF website

Data Assembly, Performance Indicators and Footprinting-Assembling a fact base, defining a set of performance indicators and comparative footprinting of cities (both traditional and leading edge) are essential to quantifying the impacts and benefit of new thinking related to water and cities of the future. Includes Case Studies, Performance Indicators and Footprinting working groups.

Plans - The COF program (COFP) will continue to be built on a principal foundation of work groups that are each tackling key areas of innovation and change needed to build cities in the future. Together, the tracks and workgroups above have provided the basic structure of the global workplan. Conferences sessions and publications are core activities of CoF including events at IWA Annual Congresses, Stockholm Water Week, Singapore Water Week, etc. . Alliances will be sought with other organisations with mutually beneficial efforts/association/agencies at the global and regional levels.

Views on IWRM - A Cities of the Future approach employs a new strategy where the delivery of all urban infrastructure and services are planned through a partnership approach between urban planners, the water sector and other sectors together to meet sustainability and liveability objectives set by the community. Traditional objectives for water system design in the city – capacity, health and safety – need to be augmented with some new and important objectives. They include:

- High levels of water and water-related energy use efficiency at the building level
- The capability to reuse water safely and repeatedly
- Wastewater treatment processes that produce energy and recover nutrients
- Smart networks that permit intra-urban reuse and minimize life cycle costs
- Resilience and adaptability in overall system design

"We are capable of doubling the efficiency of urban water use, at least in developed countries, through a combination of high levels of conservation, water reuse enabled through membrane technology, and energy and nutrient recovery. Success will be found through a combination of measures within the urban area, together with strategic trades of water with agriculture and energy."; (Reiter, P., 2011)

Vicki Elmer - Velmer@uoregon.edu; Rob Skinner - robskinner1@bigpond.com; Carol Howe - chowe@forevasolution.com

Smart practices.
Sustainable solutions.

Submitted by John Farner, Government Affairs Director, Irrigation Association, johnfarner@irrigation.org

Rallying around a mission to promote efficient irrigation, the Irrigation Association serves its members and the irrigation industry by:

- Educating the public on sound practices and water management.
- Serving as a centralized clearing house for research and innovation.
- Improving industry proficiency through continuing education.
- Recognizing and promoting experience and excellence with professional certification.
- Lending expertise to water-use public policy at the local, state, regional and national level.

Water-use efficiency in agricultural, golf and turfgrass/landscape irrigation is just part of the solution, albeit a large one. According to the United Nations Food and Agriculture Organization, "agricultural water use has helped meet rapidly rising demand for food, and has contributed to the growth of farm profitability and poverty reduction as well as to regional rural development and environmental protection." A key question is, do we have enough water to meeting the future demands placed on food production (with the demand of food expected to double globally by 2050), human consumption (sanitation) and environmental/conservation efforts?

Focusing on landscape irrigation, according to the Environmental Protection Agency, outdoor water use across the United States accounts for nearly nine billion gallons of water each day, mainly for landscape irrigation. In many parts of the U.S. households use more water outdoors than most American homes use for showering and washing clothes combined. If an irrigation system is designed, installed and/or managed poorly, much of this water can be lost to waste, but is this savings enough?

The Irrigation Association is committed to promoting efficient irrigation through four strategic initiatives:

- **Certification**
- **Education**
- **Government and Public Affairs**
- **Standards and Codes Development**

Through these for initiatives the Irrigation Association works to not only enhance the industry, but also the sustainability of our nation's water resources. This can only be done by taking a holistic view of our water resources.

In addition to efficiency, the IA also supports, through board-approved positions, a strong focus on water storage and conveyance, licensing of irrigation professionals, and alternative water sources for irrigation, among others. To achieve these goals, the IA believes that stakeholders, including the IA and those involved in the One Water Management initiative, must work together to identify common goals and sustainable solutions.

NACWA
A Clear Commitment to America's Waters

Submitted by: Adam Krantz, Managing Director, Government & Public Affairs, NACWA, *akrantz@nacwa.org*

The National Association of Clean Water Agencies (NACWA) has long been a strong advocate of the "One Water" concept and applauds the U.S. Water Alliance for its important work in this arena. Although NACWA's primary focus is on our public member agencies' wastewater treatment challenges under the Clean Water Act, many of our member agencies also have joint responsibility for providing drinking water and stormwater management services as well and must take into account water resource management as a whole. As a result, it is becoming increasingly clear that the statutory and regulatory systems – now decades old — must be reviewed with the goal of matching policy to the fact that these agencies and the communities they serve have evolved significantly over time.

From NACWA's perspective it is time to look seriously at a system that can be sufficiently site-specific and flexible to ensure that ratepayer dollars are targeted to those efforts that will yield the most "bang for the buck" from a water management standpoint. We have seen some very positive signs from the U.S. Environmental Protection Agency recently, including its support for an integrated permitting approach under the Clean Water Act and for innovative technologies, such as green infrastructure.

NACWA helped craft and has supported a document titled "Principles for a Viable Watershed Approach" along with other key organizations including the Water Environment Federation (WEF), the Natural Resources Defense Council (NRDC), the Association of Clean Water Administrators (ACWA), the American Water Resources Association (AWRA), the National Wildlife Federation, and the Environmental Law and Policy Center. As the introductory language to the Statement of Principles states, "what is needed now is a broader holistic approach that will prioritize and address the most significant current impacts on water quality in the most effective and responsible way." The 12 Principles are listed on the reverse.

NACWA believes we must do more. Taking the concept of "One Water" and transforming it from a vision into an implementable and viable policy recommendation is a tall order. But it is the only direction that makes sense as our most precious resource — water — and those tasked with collecting it, treating it and supplying it — come under increasing pressures.

Principles for a Viable Watershed Approach

1. The physical, chemical, and biological integrity of the nation's waters must be protected and restored, and addressing water quantity, water quality, and habitat impacts must be integrated through scientifically sound watershed planning and management.
2. Water quality protection efforts should generally be watershed-based, and a framework must be established to deal with watersheds that cross traditional jurisdictional boundaries.
3. All sources and activities contributing to pollution and degradation of the health of our watersheds must be identified and addressed collectively and effectively.
4. Existing tools in the Clean Water Act, such as watershed planning, should be revised so they can be more effectively used to facilitate fully integrated site-specific watershed planning.
5. More comprehensive measures must be pursued to address agricultural and other nonpoint sources, including air deposition and unregulated wet weather runoff.
6. Local stakeholder involvement and public education is required to address watershed-specific concerns.
7. Priorities for existing programs and new regulations should address the most significant sources of impairment and watershed degradation.
8. Innovative solutions, such as green infrastructure, and market-based solutions, such as water quality trading, should be encouraged and given sufficient time to become effective. These strategies, however, must not sacrifice enforceability or confidence in pollution reductions.
9. An improved monitoring and evaluation program is necessary to evaluate the chemical, physical, and biological attributes of watersheds.
10. All contributors to watershed pollution and degradation should be responsible for the costs of watershed improvements.
11. Significant federal investment is required to implement these watershed principles in a viable manner; such financial assistance should be allocated equitably among all contributors, both point and nonpoint, and should require sufficient accountability by all recipients.

Submitted by: Michael Deane, Executive Director, National Association of Water Companies, Michael@nawc.com

The National Association of Water Companies (NAWC) is proud to serve as the voice of the private water industry. The need for water is something all people share, and every day, private water service companies provide essential water and wastewater services to nearly 73 million people in the United States.

Private water companies have been providing quality service for centuries. These companies were built by men and women who engineered solutions and earned the public's trust by treating and delivering an essential resource year after year. This commitment has endured through generations and today private water companies safeguard public health, promote environmental stewardship and deliver sustainable solutions throughout the country.

Founded in 1895, the NAWC has members located across the nation and ranging in size from large companies owning, operating or partnering with hundreds of utilities in multiple states to individual utilities serving a few hundred customers.

Water treatment and delivery and the efficient removal and treatment of wastewater so it can be reused or returned to the environment is rarely top of mind in households, businesses and city halls. NAWC and our member companies are dedicated to leading the discussion about sustainable systems and infrastructure improvement, and sharing information about what our members are doing to shape the future of water management.

There already is broad acceptance of the need to manage water more holistically. The hydrologic cycle cannot be broken up by political boundaries or separated into discreet buckets of drinking water and wastewater and storm water. Water utilities are just as much a part of the watershed they are in as rivers and wetlands. One community's wastewater is the next community's drinking water.

Only by preserving this precious resource can we meet the needs of today's customers and also those in the future. Conservation and the efficient use of water are important for sustainability. We are a proud to partner with the U.S. EPA's WaterSense® program and help Americans make informed decisions when selecting water-efficient products so they can play a role in helping protect the future of our nation's water supply.

There are many barriers to overcome, but none are insurmountable. Private water companies are embracing our responsibility to manage water, fully aware of and aligned with the social, cultural and economic elements of our society. We continue to be at the forefront of a more holistic approach to resource management that embraces watershed planning and greener cities, and fosters environmental and economic vitality. Successfully responding to challenges requires more than big ideas and innovative technology. Accessible financial resources to fund projects and the management capacity to see them through from inspiration to operation are critical. Private water companies are using their unique resources to make a difference.

national ground water association®

Phone/ Toll-free 800 551.7379/ 614 898.7791 Fax/ 614 898.7786
Web/ www.ngwa.org and www.wellowner.org
Address/ 601 Dempsey Road/ Westerville, Ohio 43081-8978 U.S.A.

Who we are

Since 1948, the National Ground Water Association (USA) has been the nonprofit organization serving those working around the world in groundwater-related construction, engineering, manufacturing, product supply, science, and public water supply. Our purpose is to provide guidance to members, government representatives, and the public for sound scientific, economic, and beneficial development, protection, and management of the world's groundwater resources.

NGWA statement

The National Ground Water Association (USA), while primarily focused upon the groundwater component of the hydrologic cycle, recognizes the interdependence of water resources. The Association recognizes that unlike surface water bodies that often represent natural boundaries, as well as artificial political boundaries between people, groundwater generally does not adhere to the same restrictions and will be found below natural and political boundaries. Integrated management of water resources to meet the world's future needs necessitates the following:

- More comprehensive water-management strategies that fully recognize groundwater's important role in the hydrologic cycle. This requires better characterization of groundwater basins, including the inter-relationship of surface water bodies with the aquifer system, and a better understanding of the response of the entire hydrologic system to natural and human-induced stresses.
- Making the maintenance of hydrologic balance a long-term goal of regional water-management strategies. This requires that water managers identify options that: minimize net losses of water from the hydrologic system; conjunctively manage groundwater and surface water resources; develop manmade infrastructure based on an understanding of the natural hydrologic system; encourage wise and effective water use, and ensure the fair allocation of water for human as well as environmental and ecological needs. Ongoing, coordinated surface water and groundwater monitoring programs must become an integral part of water-management strategies in order to adapt such strategies to changing socio-economic, environmental, and climatic conditions.
- Be based on sound scientific data and research. Needed scientific information may include the hydraulic properties of aquifers, groundwater levels, accurate groundwater use and consumptive use data, aquifer water quality, groundwater recharge rates, and aquifer maps.
- Comply with environmental and public health goals. Compliance with these goals is required to provide consistent levels of environmental quality and public health protection and should work to prevent local water management districts from unexpected and unplanned costs.
- Be made at a local level, whether that is a state, some government subunit, or an aquifer or groundwater basin level. Local decision making provides the necessary flexibility to tailor the strategies to the specific situation. Groundwater resource and climatic variability makes a one-size-fits-all approach unworkable. Local groundwater management plans can incorporate site-specific information and input from all potentially affected parties. Implementation tools, such as land use planning or conservation measures, are also available at the local level.
- An informed citizenry that recognizes groundwater's essential role in their community and the importance of its responsible use. This requires that the science and applied technology communities enhance education and outreach programs to broaden understanding of the whole hydrologic system and its global importance to future generations.
- Provide for meaningful community involvement. Groundwater sustainability affects the country on an individual, local, state, and national scale. Groundwater sustainability requires the identification of current and future beneficial uses and a determination as to what consequences are acceptable. This determination is a value judgment requiring a balancing of many factors for a given situation. Factors that contribute to the availability of water resources vary from location to location due to differences in need, availability, climate, geology, hydrogeology, and solution choices.

The National Onsite Wastewater Recycling Association (NOWRA) is the largest organization within the U.S. dedicated to educating and representing professionals within the onsite and decentralized wastewater industry. Our members include educators, regulators, engineers, contractors, manufacturers, suppliers, service providers, and other parties in the protection of North America's water resources and environment. NOWRA was founded in 1992 to educate and serve its members and the public by promoting sound federal, state, and local policies, to improve standards of practice, and increase public recognition of the need for and benefits of onsite and decentralized wastewater infrastructure.

What We Do

NOWRA provides a national forum to address the challenges facing our industry. We provide education and training programs for professionals and bring uniformity to the industry. As the national educational resource and clearinghouse for onsite and decentralized systems and promoter of best management practices, NOWRA plays a lead role in state and federal legislative initiatives to protect water sources, human health, and the environment. NOWRA works to educate the public and policy makers about the advantages and benefits of onsite and decentralized wastewater management and serves as an advocate at the federal, state and local levels to encourage legislative and regulatory changes that facilitate expanded use of these systems.

What is Decentralized Wastewater Treatment?

"Decentralized system" has become a commonly-used term to describe a wastewater treatment system that treats and disperses wastewater from individual homes or a cluster of homes at or near the source of the wastewater discharge. Decentralized systems include onsite and cluster treatment systems and are highly scalable. Systems may serve a cluster of homes, a subdivision, commercial and industrial complexes, or entire communities. These systems take advantage of the vast capacity of soil to remove or transform pollutants that are in the effluent as it percolates through the soil thereby avoiding point discharges to surface waters and maintaining the quality and quantity of our groundwater. By definition, onsite wastewater management systems are a 'green technology' because treated effluent recharges local aquifers. A new innovation in decentralized wastewater management is the reuse or recycling of treated effluent. With appropriate safeguards, local regulations or bylaws may allow the treated water to be used for irrigation, toilet and urinal flushing or make-up water for commercial boilers.

The Role of Onsite and Decentralized Wastewater Treatment in One Water Management

Decentralized wastewater treatment systems are an effective solution to protecting water quality. They are a valuable component of watershed management plans and sustainable development programs. As society demands more efficient use of financial resources and sustainable environmental wastewater management, the use of managed decentralized wastewater treatment systems is a key support structure for wastewater reuse. Onsite and decentralized wastewater treatment systems can benefit both urban and rural areas by providing affordable solutions and reducing risk to the environment in unusual situations and difficult locations. These systems can provide optimal water management to homes, businesses and industrial centers. Their recycling capability can support water resource management goals in many arid areas of the country. Their use can support municipal wastewater treatment infrastructure by providing options for pretreatment and sewer mining and provide an alternative when centralized plants have reached or exceeded capacity.

Water is becoming a concern throughout the world. As more governments grasp the reality of population growth coupled with inadequate or nonexistent infrastructure, they understand the advantages of decentralized water management and realize that the 'old' solutions are not always the right approach. Onsite/cluster/distributed systems support a growing economy and address wastewater infrastructure issues while improving water quality and providing treatment capacity. Their use complements existing infrastructure in situations where centralized sewerage is impractical, unaffordable,

Since 1960, the National Waterways Conference has advocated in support of national policy and laws that recognize the vital importance of America's water resources infrastructure to our nation's well-being and quality of life and has promoted a sound balance between economic and human needs and environmental and ecological considerations.

Reliable, well-maintained water resources infrastructure is fundamental to America's economic and environmental well-being, and is essential to maintaining our nation's competitive position within the global economy. Our water resources infrastructure provides life-saving flood control, abundant water supplies, shore protection, water-based recreation, environmental restoration, and hydropower production, essential to our economic well-being. Moreover, waterways transportation is the safest, most energy-efficient and environmentally sound mode of transportation.

The National Waterways Conference supports -

- Rational, balanced, common sense policies and programs that recognize the multiple uses of water and the essential contributions of a healthy and environmentally sound water resources infrastructure to the nation's economic prosperity, public health and national security.

- Robust investments in critical water resources infrastructure, including funding for operation and maintenance sufficient to preserve the value of prior investments, to ensure that water resources will continue to contribute to the quality of life enjoyed by every American and sustain our global economic prominence.

- An investment decision process for new projects that reflects the national interest in water resources premised upon proven analytical tools and an evaluation of a full range of alternatives.

- Cooperation among stakeholders and all levels and agencies of government that recognizes and respects national, regional, state and local differences in priorities and values related to water resources and that supports decision-making at the lowest practicable level.

Contacts:

Amy Larson
President
National Waterways Conference
703-224-8007
amy@waterways.org

William Anderson
Of Counsel
Williams Mullen
202-327-5060
wanderson@williamsmullen.com

or OLIS
Oregon Leadership in Sustainability

water reuse is desired.

Planning, Policy and Management, University of Oregon

Overview: The Oregon Leadership in Sustainability is a graduate program at the University of Oregon committed to interdisciplinary learning for the future leaders of tomorrow. It was created by the State of Oregon's University System to meet the challenges of climate change and the need for future leaders who can solve problems that cross traditional professional boundaries, and who can look at issues from a systems point of view. Its focus is on sustainable cities and the built environment.

Course Offered and Water: OLIS offers a professional one year cohort based resident graduate certificate. Courses span traditional disciplinary offerings and where necessary, courses are developed that stress a systems view of the built environment. OLIS offers a course on Water and the Urban Environment that emphasizes One Water Management, the intersection of urban planning, architecture and the need for a more integrated approach to land use and water planning and their respective institutions.

Changes in Educational Systems: OLIS encourages faculty and students to break down the traditional barriers between disciplines in education and to participate actively in organizations such as the Association for the Advancement for Sustainability in Higher Education where such changes are promoted. From the OLIS point of view, achieving One Water calls for rethinking of the educational systems for planners and engineers along with changes in on the ground practices in cities as well as with the utilities. Much progress has been made in this respect in the field of transportation for example. Participation in the Water Alliance is seen as a way to make these kinds of changes within and beyond Oregon.

Vicki Elmer, PhD., Director, Oregon Leadership in Sustainability
University of Oregon, velmer@uoregon.edu http://olis.uoregon.edu

Submitted by Heather Cooley, Water Program Co-Director, Pacific Institute

The Pacific Institute is one of the world's leading nonprofit research and policy organizations working to create a healthier planet and sustainable communities. Based in Oakland, California, we conduct interdisciplinary research and partner with stakeholders to produce solutions that advance environmental protection, economic development, and social equity – in California, nationally, and internationally.

Since our founding in 1987, the Pacific Institute has worked to identify challenges facing our water resources and find solutions – solutions that promote the sustainable management of water resources, in California and around the world. Examples of the Pacific Institute's work in this area include the following:

- In 1995, we published the first "Vision" of a sustainable water system, and we continue to produce these scenarios. Our work includes both detailed quantitative analysis of what a positive future vision would look like and explicit recommendations for how to achieve it.

- We did some of the first science on the impacts of climate change on western water resources and continuously encourage water managers to integrate that science into policy and planning. We maintain the water and climate bibliography, which provides the latest information on the impacts of climate change on water resources. Recent work evaluates the connections between water and energy and provides tools for water managers to evaluate the energy and greenhouse gas implications of their water management decisions.

- We've worked to define the "soft path" for water, a water-management approach that seeks to improve the overall productivity of water; match water quality to the users' needs; meet basic human and ecosystem water needs as a top priority; and integrate planning and decision-making across sectors to promote projects or facilities that produce multiple services; and supports meaningful local and community engagement.

- Our comprehensive analysis of the potential for urban and agricultural water conservation in California ("Waste Not, Want Not") has dramatically changed the discussion about water policy from the Middle East to Singapore to San Francisco. We've continued with new analyses for cities, counties, and water districts around the country.

- We've produced research and analysis on the role of various actors in water governance, including that of the federal government, private sector, and international institutions.

Underlying all of the Pacific Institute's work is the belief that a new approach to the way we plan, manage, and use water is urgently needed. The good news is that we are making progress. We have focused water policymakers at all levels to look at the risks of climate change on water supply. Our push toward a reevaluation of the importance of water-use conservation and efficiency is leading to fundamental changes in water policy in the western United States and around the world. The work continues, because more needs to be done – much more. The most important change we can make is in the way we think about, value, and manage our water.

Submitted by: Carol Howe, SWITCH Project Manager, Sustainable Urban Water Management Improves Tomorrow's Cities Health / Director, ForEvaSolutions, chowe@forevasolutions.com

Organisation Description - SWITCH was an action research program (2006-11) funded by the European Union that was implemented and co-funded by a cross-disciplinary team of 33 partners from across the globe, including 17 from Europe and 12 from South America, Asia and Africa. It was coordinated by UNESCO-IHE (Water Education Institute) in The Netherlands. The consortium represented academia, urban planning, water utilities and consulting interests. This network of researchers and practitioners worked directly with "Learning Alliances" in 12 cities around the globe. The overall goal behind this global consortium was to catalyse change towards more integrated, resilient and sustainable urban water.

Activities - The project had four key activity areas – research, demonstrations, training and dissemination. A major outcome of the SWITCH project was the development of the 'SWITCH approach'. The SWITCH project adopted a "grey to green" approach, recognising that green infrastructure (like parks and clean rivers) is not only "nice to have", but also provides "the environmental foundation that underpins the function, health and character of urban communities" (CABE, 2009). The key features of the SWITCH approach are:

- Establishment of city learning alliance platforms – these multi-stakeholder learning alliances guided and supported SWITCH on the development and implementation of demand driven, research and demonstration activities, by taking account of local problems and needs.
- Implementation of a strategic planning process – this encourages and enables all stakeholders in the city to view the urban water cycle in an integrated way and allows the development of new strategic directions for urban water management.
- Establishment of early-action demonstrations representing different aspects of the water cycle that are designed for up-scaling at both the local and global level.
- Development of a training toolkit with the city learning alliances to maximise the utility and impact of the SWITCH approach.

Plans - The learnings from SWITCH are being taken forward through new initiatives. The SWITCH Training Toolkit (inc. modules on Strategic Planning, Involving all the Players, Water/Wastewater/Stormwater Option Exploration and Decision Support Tools) is being disseminated to local governments by ICLEI. UN Habitat has adopted the SWITCH approach in African projects and UNESCO-IHE has incorporated SWITCH into its teaching modules.

Views on IWRM - The design and management of the entire water system will lead to more sustainable solutions than separate design and management of elements of the system. Cities are a critical component of IWRM at the watershed scale but have specific needs for integration and action. SWITCH advocates a demand driven approach to IWRM recognizing that action needs to occur at multiple levels – local, regional and National, across the entire water system (water, wastewater, stormwater and natural systems) in combination with other infrastructure and services (energy, transport, buildings, food production) and planning activities, and through multiple mechanisms (regulatory, innovation in technology, incentives, institutional change, etc.). Local demonstrations are key to transitioning and capacity building. Integration is more effective when augmented by neutral facilitation and adequate funding for engagement.

US Army Corps of Engineers®

Submitted by: Steven L. Stockton, P.E., Director of Civil Works, U.S. Army Corps of Engineers, steven.l.stockton@usace.army.mil

For more than 230 years, the U.S. Army Corps of Engineers (USACE) has been a leader in the development and management of water resources in the United States. As USACE moves through the 21st Century, it will continue to advance the strategic goals of assisting in providing for safe and resilient communities and infrastructure; helping facilitate commercial navigation in an environmentally and economically sustainable fashion; restoring degraded aquatic ecosystems and preventing future environmental losses; and implementing effective, reliable, and adaptive life-cycle performance management of infrastructure.

To accomplish these strategic goals, USACE applies an overarching strategy of Integrated Water Resources Management (IWRM), which seeks to foster equitable, efficient management and sustainable use of water. IWRM promotes the coordinated development and management of water, land, and related resources to maximize economic and social welfare without compromising the sustainability of vital ecosystems. Such integration is essential given the Nation's multi-layered governance system that crosses watershed boundaries and the interdependent relationship between the natural and built environment.

This strategy will address key external forces such as climate change, demographic and associated land use changes, and resource constraints and focus on implementation of innovative and resilient solutions to the Nation's water resources planning and management needs.

Components of our IWRM strategy include:

- **Systems Approach** – Water resources planning and management should focus on watersheds, using systems analysis methods and tools to understand, assess, and model the interconnected nature of hydrologic systems and the economic and ecologic systems they support, and to identify and evaluate management alternatives from both time (life-cycle) and function (multi-purpose) perspectives.

- **Collaboration and Partnering** – We seek to build and sustain partnerships at all levels to leverage authorities, funding, talent, data, and research from multiple agencies and organizations. The complexity of water resources development and management requires close partnerships and collaboration. The development of federal, state, local and private partnerships, along with increased stakeholder and non-governmental collaboration, is essential to achieve the most efficient and sustainable solutions. Transparency within USACE activities is a key component in achieving this collaboration.

- **Risk-Informed Decision Making and Communication** – We employ risk and reliability-based approaches that incorporate consequence analysis, especially risk to humans; identify, evaluate, and forestall possible failure mechanisms; and quantify and communicate residual risk.

- **Innovative Financing** – We think beyond traditional government appropriations and seek innovative arrangements such as public-private partnerships, revised funding prioritizations, and other appropriate mechanisms to develop and sustain the Nation's water infrastructure.

- **Adaptive Management** – We embrace a flexible decision process that can be adjusted in the face of risks and uncertainties—such as those presented by climate change—as outcomes from management actions and other events become better understood through monitoring and improved knowledge.

Submitted by: Suzanne van Drunick, Ph.D., SSWR National Program Director, United States Environmental Protection Agency - Safe and Sustainable Water Resources (SSWR) Research Program, vanDrunick.suzanne@epa.gov

EPA's Office of Research and Development (ORD) has realigned its former Drinking Water and Water Quality research programs to create the Safe and Sustainable Water Resources (SSWR) Research Program. The SSWR Research Program provides the scientific information needed to achieve sustainable solutions to 21st century water resource problems through a systems approach integrating research on environmental, economic and social outcomes to provide lasting solutions.

The goals for SSWR research stem from EPA's mandate and the needs for EPA's National Water Program to: 1. Protect public health and the environment; 2. Protect and restore water sustainably to ensure that drinking water is safe and that aquatic ecosystems sustain fish, plants and wildlife, and to meet societal, economic and environmental needs; and 3. Manage water resources in a sustainable manner that integrates surface water, groundwater, drinking water, wastewater and reclaimed water in a 'one water' approach; maximizes the recovery of energy, nutrients, water and other materials for reuse; and incorporates comprehensive water planning and optimum combinations of built, green and natural infrastructure.

SSWR Problem Statement: Increasing demands for sources of clean water, combined with aging infrastructure; food and energy production; and changing land use practices, demographics, climate and extreme events, pose significant threats to the Nation's water resources. Failure to manage the Nation's waters in an integrated, sustainable manner will limit economic prosperity and jeopardize human and aquatic ecosystem health.

SSWR Vision Statement: Purpose-driven research for innovative solutions to water resource challenges.

In a water-connected world, sustainable solutions will require a systems approach. SSWR uses two broad, interrelated research themes as its framework:

- **Sustainable Water Resources**: Ensure safe and sustainable water quality and availability to protect human and ecosystem health by integrating social, economic and environmental research for use in protecting and restoring water resources and their designated uses (e.g., drinking water, aquatic life, recreation, energy production, industrial processes, other designated uses) on a watershed scale.

- **Sustainable Water Infrastructure Systems**: Ensure the sustainability of critical water resources using systems-integrated water resource management in which the natural, green and built water infrastructure is capable of producing, storing and delivering safe and high-quality drinking water, and providing transport and use-specific treatment of wastewater and stormwater.

The U.S. Water Partnership (USWP) is a once-in-a-generation public-private partnership that envisions a future where partners "work together for a water secure world."

Today, the USWP has more than 60 partners (including the U.S. Water Alliance and several of its member organizations) who have committed over $600 million in financial and in-kind assets to unite and mobilize 'best of the U.S.' expertise, resources, and ingenuity to address global water challenges where needs are greatest. The USWP is facilitating, unifying, and enabling American strengths and delivering innovative and practicable solutions by connecting people and matching resources to needs; centralizing access to unified water data and knowledge; building capacity through training and knowledge sharing; leveraging assets of partners to replicate and scale successes; and offering integrative and collaborative solutions.

To showcase its mission in action, the USWP has six Signature Initiatives focused on a variety of water challenges to meet key objectives:

- The Multiple Use Water Services (MUS) Initiative (led by the Rockefeller Foundation and Winrock International) has developed a plan of action to increase the adoption of MUS through engaging policymakers and practitioners in several key geographies. An exchange visit and workshop to Tanzania is planned for Q3 2013.
- The Improving WASH Access in Africa Signature Initiative (led by The Coca-Cola Company) launched activities to bring clean water access to more than 200,000 people in Ethiopia, Somaliland, DRC, Mozambique and Madagascar.
- The Water Security/Water Risk Signature Initiative (led by the Skoll Global Threats Fund) carried out two high level events on the side of the UN General Assembly that convened thought leaders including then Secretary of State Hillary Clinton and Catherine Ashton EU High Representative for Foreign Affairs and Security Policy, among others. Additionally, it held an event on Water, U.S. Foreign Policy and American Leadership in Washington, D.C. Several strategic events are scheduled for Q3-Q4 2013.
- The Web Portal Signature Initiative team (led by the Global Environment & Technology Foundation and the U.S. State Department) selected a vendor to develop a knowledge management tool to connect developing world users to a vast array of already existing U.S.-based resources. Datasets have been secured from a wide range of Partnership members from NASA to NOAA and The Coca-Cola Company to the University of Texas at Austin.

Working with its Steering Committee, the Partnership has developed new processes and mechanisms to evaluate new candidates for Signature Initiatives. This resulted in the launch of two new Signature Initiatives on World Water Day 2013, which include The Nature Conservancy's Great Rivers Partnership (GRP) and Conservation International's Alliance for Global Water Adaptation (AGWA). The platform for Signature Initiatives harnesses the convening power of the USWP to ensure more partners are engaged, more resources are leveraged, and greater impacts are experienced. To review the process and criteria or to learn more about the Signature Initiatives, click here.

We are just getting started. Join us and become a part of America's water solutions. For more information or questions regarding the U.S. Water Partnership please visit http://www.uswaterpartnership.org or email Chuck Chaitovitz at chuck.chaitovitz@uswaterpartnership.org.

- Respect water laws. Water laws must be viewed as a current statement of community values and judgment.

Submitted by Edwin Pinero, Chief Sustainability Officer, Veolia Water North America, ed.pinero@veoliawaterna.com

Based in Chicago, Veolia Water North America is the leading provider of comprehensive water and wastewater partnership services to municipal and industrial customers, providing services to people in approximately 550 North American communities and more than 100 manufacturers and companies. The company is part of Veolia Water, the world leader in water and wastewater services and technological solutions.

Major cities have become the planet's main social and economic centers. Competition between them to attract investment and talent is increasing. Good quality of infrastructure, living environment and sustained reliability of water supply is becoming a critical differentiating factor as people become more demanding. Industry leaders will direct their investments where water risk is best mitigated. In this context, water also emerges as a new opportunity for economic development. For example, wastewater can be viewed as a feedstock to recover materials and energy, while at the same time eliminating waste streams. These factors are all important to Integrated Water Resource Management (IWRM).

A national water strategy that strives to encourage water efficiency, water reuse, resource recovery, and protection of the ecosystem services value of water will lead to sustainable IWRM. Raising awareness of the nexus between water energy, and between water and food, will also help ensure that water is not forgotten when determining energy and agricultural policy and practices. A much more holistic understanding of how our actions affect the water and its role in the ecosystem is required. This not only includes quality impacts, but also quantity implications and scarcity factors. Finally, recognizing the true value of water, such that water pricing is more realistic and consistent with what water delivery actually costs, will lead to more resources to secure our aging infrastructure. Ironically, one fundamental, cross-cutting reason why water is a potential risk to national security is that it is, essentially, too cheap.

To that end, Veolia Water's perspective is based on three goals:

- Inform – Veolia Water seeks to raise awareness on the interplay of water, energy, and food. For example, with *growingblue.com*, users are provided data and tools in which to inform decisions and find water solutions at the municipal, agricultural and industrial level.

- Perform – Through its performance and sustainability initiatives Veolia Water is looking to integrate and capitalize on efficiencies in energy use and resource recovery from waste water. We know that our current infrastructure is not as efficient as it could be. As a water service provider, Veolia has a core value regarding this efficiency concept; we need to get as much as we can from what we have.

- Engage – Through tools such as its Water Impact Index, decision makers can factor in three essential elements – quantity of water used, level of stress upon water resources, and overall water quality.

Submitted by: Jeff Eger, Executive Director, Water Environment Federation, jeger@wef.org

Formed in 1928, the Water Environment Federation® (WEF®) is a not-for-profit technical and educational organization with 36,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. WEF and its Member Associations proudly work to achieve our mission of preserving and enhancing the global water environment®.

WEF has a diverse membership of utilities, consultants, manufacturers, regulators, academics, and researchers. Our educational programs help to prepare our members to develop holistic solutions and our public education and advocacy programs embrace an integrated approach. WEF is fully supports of the concept of integrated water management and first articulated this approach along with AWWA, AMWA, NRDC, EPA, USDA, and NOAA in the *Water Quality 2000* report and reaffirmed it in the 2010 Johnson Foundation *Charting New Waters* report.

WEF has taken formal positions on issues such as water quality, water reuse, and stormwater (excerpts below) and is in support of a broader, holistic, watershed approach to meeting the Clean Water Act (CWA) goals in the U.S. A recent position on modernizing the CWA states that the overarching principal should be employment of a holistic approach to water quality management that integrates water quality and quantity and the benefits provided to the environment, community and economy.

On water quality, watershed planning and management: *The Water Environment Federation supports the watershed approach of protecting and restoring water quality. The watershed approach stems from the knowledge that all ecosystems are linked together*.

On water quality, priority setting: *The Water Environment Federation supports a priority setting process allowing governments and watershed managers enhanced flexibility in scheduling and standard-setting within the context of economic, technical, and social capabilities. A priority setting framework must support water quality managers in using appropriate data and tools, promoting inclusive resource protection, conducting economic and risk analyses, considering cross-media impacts, and accounting for regional growth. Water quality priorities and solutions must be established regionally to best address water quality impairment from local and outside sources. The general public should collaborate in priority setting with engineers, scientists, and other experts to ensure long-term support for and implementation of water quality programs.*

On water reuse: *WEF recognizes that the world's water supply is a finite resource and the practice of water reuse is key to the conservation of this natural resource. Thus, WEF supports the use of reclaimed water for non-potable purposes as a means of conserving potable water supplies. Also, WEF supports the consideration and use of highly treated reclaimed water for indirect potable reuse and encourages public involvement in all aspects of water reuse projects. The reuse of municipal wastewater for beneficial purposes is an important element of the world's total water resources management. The use of reclaimed water for domestic, industrial, commercial, agricultural, environmental, and other purposes can conserve and extend freshwater supplies.*

On stormwater, WEF believes a “21st Century Stormwater Management” approach is needed to address the impacts of stormwater on water quality and that: *EPA should update CWA-related regulations that oversee stormwater-generated flows by adopting a number of the recommendations provided by the 2009 NRC report.*

WEF collaborates regularly with our water association partners, working with AWWA on the Utility Management Conference™ and WateReuse Association and AWWA on the WateReuse Symposium, bringing together practitioners with varied water expertise to exchange knowledge and best practices. Our annual WEFTEC program covers all facets of the water cycle and includes recent sessions on Total Water Management and a 2012 workshop on the Cities of the Future concepts, working with the International Water Association.

But fundamentally, integrated water management is not just a technical challenge. While innovative technologies and approaches are needed to move our sector forward, integrated water management also requires a greater understanding of the value of water and the importance of the water profession. Advocacy on behalf of the water sector at the local, state, and national level is needed to raise awareness with decision-makers and the general public.

Water Environment Research Foundation
Collaboration. Innovation. Results.

Submitted by: Jeff Moeller, Director of Water Technologies, Water Environment Research Foundation, jmoeller@werf.org

WERF is a non-profit research foundation dedicated to advancing water quality science and knowledge. WERF initiated a dedicated, multi-year research program on Sustainable Integrated Water Management (SIWM) in 2011. The goal if this research is to facilitate change by acting as a catalyst and providing the technical support for a paradigm shift in water management for cities and towns toward sustainable systems that integrate wastewater, stormwater, drinking water and source water, as well as other infrastructure (e.g., energy, transportation, parks, etc.).

Example projects under the SIWM program include:

- One Water Management (OWM) Network: WERF sponsored the 2012 kick-off meeting for the OWM network being led by the US Water Alliance, and co-sponsored the 2013 follow-up meeting with WaterRF and WateReuse Research Foundation.
- Institutional Issues for Green-Gray Infrastructure Based on Integrated "One Water" Management and Resource Recovery (summer 2013 project kick-off)
- Evaluation of Green Infrastructure Demonstration Projects (collaborative project under development)
- Manual on How to Incorporate Land Use into Water Planning (RFP under development)
- Design Competition for Wastewater, Stormwater, and Water Infrastructure Configurations that Maximize Materials and Energy Recovery and Water Reuse (new project under development, partners sought)

WERF's SIWM research program is complemented by other major WERF multi-year research programs which help support some of the goals of integrated water management including:

- Energy Research: The goal of this program is energy self sufficiency for wastewater treatment plants.
- Resource Recovery Research: The goal of this program is to support the transition from a treatment-based industry to a resource reclamation industry recovering nutrients and other valuable products from wastewater.
- Water Infrastructure for the 21st Century: This EPA grant-funded program implemented in partnership with Water RF embraces the broad goal of attaining sustainability of operations and seeks practical solutions in the areas of condition assessment, system rehabilitation, advanced approaches in design and management, and innovative treatment methods.

The above ongoing efforts build on a number of completed research projects that have laid the foundation for WERF's SIWM research program, including:

- Baltimore Charter (2007). WERF sponsored a research needs workshop in Baltimore as part of an international conference on sustainable water systems. The workshop produced a document called the "Baltimore Charter". The charter was drafted as a commitment to design new water systems that mimic and work with nature and that use integrated approaches.
- Briefings. WERF, in partnership with the Decentralized Water Resources Collaborative, sponsored a series of Federal Agency and NGO briefings on integrated approaches, most notably:
    - Smart, Clean & Green: 21st Century Sustainable Water Infrastructure (2009)
    - Integration: A New Framework and Strategy for Water Management in Cities and Towns *(2010)*
- These briefings focused on emerging smart, clean and green approaches in water management and integrated water and other resource infrastructure in revitalizing cities for the 21st Century.
- Sustainable Water Resources Management Vol. 3: Case Studies on New Water Paradigm (2010).
- In partnership with the Electric Power Research Institute, WERF funded a report that outlined the principles and tenets of a new sustainable water infrastructure paradigm. The report also constructs a framework for supporting the transition to such a paradigm.

Drinking water is an integral part of integrated water resources management (IWRM) or a "One Water" paradigm. The Water Research Foundation's (WaterRF) mission to advance the science of water is reflected in an extensive body of research that will provide a drinking water contribution to the national discussion of IWRM. WaterRF's 900+ water utility subscribers, representing 80% of municipal drinking water supplied in the U.S., are increasingly interested in sustainable approaches to water supply development including the protection of raw water supplies, utilization of impaired sources of supply, water conservation, development of more energy efficient water treatment approaches, and the minimization of environmental impacts of operations. These interests are challenged by increasing population coupled with reduced per-capita demand, aging infrastructure and a lack of funding for repair/replacement, reduced revenue from successful conservation campaigns and a fluctuating national economy, more stringent regulation, and increasing customer expectations.

Several recently published reports reflect WaterRF's commitment to understanding a more integrated approach to water management. A few examples are listed below.

- ***Integrated Urban Water Management Planning Manual (WaterRF and CSIRO 2010):*** This report describes a process for municipalities to transition to an urban water management practice that minimizes impacts on the natural environment, maximizes the contribution to social and economic vitality, and facilitates overall community improvement. It was prepared in partnership with the Commonwealth Scientific & Industrial Research Organization (CSIRO) of Australia.
- ***Source Water Protection Vision and Roadmap (WaterRF 2011):*** Source water protection (SWP) has been discussed and promoted in an ad hoc fashion by different organizations at the national, regional, state and local levels. It is essential to increase awareness of SWP at the national level and this document presents a vision that by 2025 every public community water supply will be protected by an active SWP program. The vision is followed by a national roadmap to raise awareness, enhance coordination, provide support, and increase recognition so that the vision may be achieved.
- ***Water Footprinting in the Urban Water Sector (GWRC 2011):*** This Global Water Research Coalition (GWRC) report outlines a framework for the urban water sector, which includes drinking water, storm water and wastewater services, to compare/contrast water footprinting techniques with other techniques to evaluate sustainability.

Further, two recent collaborations will shed more light on opportunities to manage water under a "one Water" paradigm and the challenges that need to be overcome.

- **"Institutional Issues for Green-Gray Infrastructure Based on Integrated "One Water" Management and Resource Recovery" (WaterRF #4487, WERF #SIWM2T12)**, a collaboration with WERF and Water Quality Research Australia, will explore the institutional issues and governance structures impacting established water, wastewater and stormwater management. Approaches to a "One Water" paradigm will be identified along with information to overcome barriers.
- **"On-Site Reuse of Graywater and Stormwater: An Assessment of Risks, Costs and Benefits" (WaterRF #4502)**, a collaboration with the National Academies and several other organizations, will analyze the risks, costs, and benefits of on-site water reuse of stormwater and graywater, and address approaches needed for its safe use, thereby providing important guidance to state and local governments, and federal agencies on this topic, which is currently minimally regulated.

Water Footprinting in the Urban Water Sector **(GWRC 2001)** identifies ill-defined and inconsistently used terminology, which leads to unnecessary complexity and uncertainly, as a key challenge of applying water footprinting techniques. The same can be said about the terminology used in IWRM. There is a great deal of confusion within the water community about IWRM and the scale to which it can be applied. The WaterRF is pleased to be a part of this discussion and

Sustainable Solutions for a Thirsty Planet®

Submitted by: Wade Miller, Executive Director, WateReuse Association, wmiller@watereuse.org

Mission

The mission of the WateReuse Association is to advance the beneficial and efficient uses of high-quality, locally produced sustainable water sources for the betterment of society and the environment through advocacy, education and outreach, research, and membership.

Relationship to One Water

Our Association provides education, advocacy, and peer networking opportunities related to two major solutions to a sustainable water future: water reuse and desalination. The Association's Activities in support of water reuse and desalination as key components of an integrated water management approach include the following:

Federal Advocacy Initiatives — The WateReuse Association has a strong federal advocacy program. The Association lobbies for funding support for reuse and desalination research and local water reuse and desalination projects. The Association also tracks relevant water legislation, supports bills important to members, and maintains close contact with Congress and federal agencies.

State Legislative and Regulatory Support — WateReuse California works to secure grant and loan funding for local reuse projects, obtain research funding, and remove barriers to reuse. The Association is prepared to assist other states with advocacy activities related to legislation, regulations, funding for local projects, and removal of barriers to water reuse and desalination.

Annual WateReuse Symposium — the only national conference devoted exclusively to water reuse and desalination. The Symposium features prominent speakers who present the latest information on applications, technologies, health and safety, funding, and legislative and regulatory activities.

Publications — In collaboration with the WateReuse Research Foundation and the Water Environment Federation, the Association produces a quarterly journal titled World Water: Water Reuse & Desalination, which provides practical global water reuse and desalination information for the full spectrum of water professionals. The Association also has published case studies reports and manuals for developing a water reuse program and supervising a site that uses recycled water for irrigation.

Outreach and Communication — WateReuse communicates the value of water reuse and desalination to community leaders and the public by conducting research on public perception, ensuring that regulations are written to protect public health and the environment, and serving as a resource for local decision-makers. The Association maintains a website for industry professionals (www.watereuse.org) and a website for the general public (www.athirtyplanet.com).

Submitted by: Julie Minton, Director of Research Programs, WateReuse Research Foundation, jminton@watereuse.org

Mission
The mission of the WateReuse Research Foundation (Foundation) is to conduct and promote applied research on the reclamation, recycling, reuse, and desalination of water. The Foundation's research advances the science of water reuse and supports communities across the United States and abroad in their efforts to create new sources of high quality water through reclamation, recycling, reuse, and desalination, while protecting public health and the environment.

Relationship to *One Water*
There is no new water – all water is used and reused. Water reuse is being practiced whether intentional (purple pipe, indirect potable reuse, direct potable reuse) or not (downstream communities). Alternate supplies of water, like recycled water and desalinated water, are important pieces of the water portfolio. They offer a sustainable, climate independent solution for all communities, including those that are facing dwindling supplies and increased demand.
Since our Foundation produces research related to the two major solutions for a sustainable water future, water recycling and desalination, our entire research portfolio speaks to One Water's mission of integrated water management. Through applied research, we strive to prove the safety and sensibility of using these "new" water supplies. We engage in cutting edge research to drive the industry forward – from evaluating the latest treatment technologies to outlining ways to garner public acceptance. Here are some examples of our notable activities and research:

Direct Potable Reuse Initiative
The Foundation, in partnership with WateReuse California, launched the Direct Potable Reuse (DPR) Initiative in 2012. California's unique water availability complexities are legendary. The goal of the Initiative is to raise a minimum of $6,000,000 for research that will position and activate educational outreach about the potential of DPR, assist the California Department of Public Health in meeting a legislative mandate to come up with a Feasibility Plan for DPR, and to further promote the potential of water reuse as a supply solution.
The State of California has the most ambitious goals in the nation for dramatically increasing the use of recycled water by 2020 – a four-fold increase – that would be impossible to achieve with "purple pipe" alone. The Foundation is currently preparing RFPs for release in the summer of 2013 for three high priority research projects valued at $800,000 in contract awards:

- ***Integrated Management of Sensor Data for Real Time Decision Making*** (WateReuse-13-01)
- ***Model Public Communication Plan for Advancing DPR Acceptance*** (WateReuse-13-02)
- ***Critical Control Point Assessment to Quantify Robustness and Reliability of Multiple Treatment Barriers of DPR Scheme*** (WateReuse-13-03)

Fit for Purpose Water: The Cost of "Over-Treating" Reclaimed and other Water (WateReuse-10-01) **Active.** This project will help ensure that the right process and technology is applied to match water quality with its intended use, without expending unnecessary funds, energy, and greenhouse gas (GHG) emissions to treat water beyond what is suitable or necessary for the intended application by using a triple bottom line (TBL) approach. *The final product is expected next year.*

Downstream: Context, Understanding, and Acceptance (WateReuse-09-01) **Published.** As part of the Foundation's research on the public's perspective towards water reuse, the Foundation released an executive summary, a video presentation, and a full report available at the Foundation website and athirstyplanet.com. These products which put water reuse in the perspective of the urban water cycle are great promotional pieces to simply communicate water reuse as a sustainable and safe water source.

Western Coalition of Arid States

"The Voice of Water Quality in the Arid West"

Submitted by: Edward Curley, President, Western Coalition of Arid States, Ed.Curley@pima.gov

Integrated Water Management for sustainable water quality and quantity in the Arid West

WESTCAS (The Western Coalition of Arid States) is a grassroots organization advocating to water programs and regulations which assure adequate supplies of high quality water and protect the environment for those living in the arid regions of the United States. The Arid West has unique ecosystems with annual precipitation often less than 12 inches and many months of no rain. Consequently, it is essential to protect both the quantity and quality of water supplies. To this end, in 1992 many of the region's water and wastewater providers joined together to share their talents and resources, assuming the name of WESTCAS.

WESTCAS currently includes over 120 water and wastewater agencies, affiliate and associate members in Arizona, California, Colorado, New Mexico, Nevada, and Texas. During its last two decades of advocacy and activities, WESTCAS has been a significant contributor to policy, regulations, science, and legislation on Arid West water resource issues. This is why WESTCAS is known as the "Voice of Water Quality in the Arid West". WESTCAS continues to provide a forum for its members to become knowledgeable and involved in current national and regional water and wastewater policies, Federal legislation, pressing regulatory issues and significant national litigation, as well as the latest technical and policy perspectives on issues such as arsenic, WET testing and contaminants of emerging concern (CECs).

WESTCAS has always been an advocate for environmentally sound management of water resources. In this regard, WESTCAS firmly believes in a holistic approach to protecting our precious water resources in the Arid West. Water services for homes, farms and industry, efficient treatment of wastewater, non-traditional sources of water (brackish and storm water), and the beneficial use of recycled water are all viewed as partner elements of the total water cycle in the Arid West. WESTCAS espouses a vision of sustainable water quality and quantity in the Arid West. Sustainability requires considering environmental, social and economic factors in managing water resources, which in turn requires a coordinated effort at many levels and with all impacted stakeholders. Examples of some past and current WESTCAS activities in this regard are as follows:

- WESTCAS advocated for and supported the work of the Arid West Water Quality Research Project (AAWQRP) during its development and implementation from 1995-2007.The AAWQPR was a long-term EPA-funded research project managed by Pima County to establish water quality criteria and standards to address the unique characteristics of water bodies in the Arid West. The Project ultimately developed a peer -reviewed new paradigm for water quality standards for effluent-dependent ecosystems in the Arid West and throughout the country

- WESTCAS has initiated a greater awareness among agencies, organizations, and policy-makers at the regional and national levels regarding the need for a good scientific understanding of the diversity and complexity of Arid West environments and ecosystems. WESTCAS promotes the Integrated Water Management concept in its meetings, workshops, and conferences. The presence of nationally renowned speakers on this topic at our major conferences has led to extended dialog and sharing of experiences between members at our meeting sessions and workshops.

In summary, Arid West water and wastewater agencies are long-time advocates of recognizing raw water, potable water, storm water, wastewater, and recycled water as integrated components of water supply. WESTCAS members put this concept into practical operation every day through the use of sophisticated water distribution systems for potable water

Water in the West is an increasingly scarce and precious resource, given population growth and an expanding range of often competing economic and ecological demands, as well as changing social values. Surface and ground water supplies in many areas are stressed, resulting in a growing number of conflicts among users and uses. A secure and sustainable future is increasingly uncertain given our climate, aging and often inadequate water infrastructure, limited knowledge regarding available supplies and existing and future needs and uses, and competing and sometimes undefined or ill-defined water rights. Effectively addressing these challenges will require a collaborative, cooperative effort among states and stakeholders that transcends political and geographic boundaries.

- State primacy is fundamental to a sustainable water future. Water planning, policy, development, protection, and management must recognize, defer to, and support state laws, plans, and processes. The federal government should streamline regulatory burdens and support implementation of state water plans and state water management.

- Given the importance of the resource to our public health, economy, food security, and environment, water must be given a high public policy priority at all levels.

- An integrated and collaborative approach to water resources management is critical to the environmentally sound and efficient use of our water resources. States, tribes, and local communities should work together to resolve water issues. A grassroots approach should be utilized in identifying problems and developing optimal solutions.

- Any approach to water resource management and development should accommodate sustainable economic growth, which is enhanced by the protection and restoration of significant aquatic ecosystems, and will promote economic and environmental security and quality of life.

- There must be cooperation among stakeholders at all levels and agencies of government that recognizes and respects national, regional, state, local and tribal differences in values related to water resources and that supports decision-making at the lowest practicable level.

This vision represents an internal WSWC policy document that will be presented to the Western Governors' Association for adoption at their June 2012 annual meeting as part of a water policy report.

While we have not specifically defined "Integrated Water Resources Management," our vision and various external policy statements address key concepts. First and foremost, IWRM must be built on a foundation of State primacy, with solutions to water problems developed from the bottom up, recognizing the important roles of all levels of government and the involvement of non-governmental stakeholders. Different values (and uses) must be recognized, respected and integrated into decision-making at the lowest practicable level, encouraged and facilitated by federal assistance, while balancing national, cultural, social, economic, and environmental needs. IWRM involves water quantity and quality, surface and ground-water, conservation and development, preservation and wise use, structural and non-structural solutions. It encompasses protecting, planning, developing, managing and restoring our national water resources and related infrastructure for present and future generations. It must be based on sound science, data and research.

and agriculture, advanced wastewater reclamation facilities, and the significant use of reclaimed water throughout the Arid West - all hallmarks of the Integrated Water Management concept.