RIVER VOICES

INTEGRATED WATER MANAGEMENT

January 2017 Issue

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river NETWORK
connecting people · saving rivers

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MISSION, VISION, AND FOCUS

River Network empowers and unites people and communities to protect and restore rivers and other waters that sustain all life. We envision a future of clean and ample water for people and nature, where local caretakers are well-equipped, effective and courageous champions for our rivers. Our three strategies for focused investment are strong champions, clean water, and ample water.

IN THIS ISSUE

In this issue of River Voices, we have a great collection of articles from a diverse set of contributors, all with decades of experience and insight on what integrated water management means and why it is important. From the nonprofit sector and foundation perspective, to consultants and utilities, each article is easy to access, fast-paced, and full of links and new information to introduce you to and expand your understanding of integrated water management. **Thank you contributors!**

Integrated water management is one of those phrases that do not always translate well beyond the world of water. What we all know is that water is complex, governed by a myriad of laws and policies, and not quite "contained" within any one discipline. Integrated water management takes on the puzzle of identifying the administrative, political, legal, and other boundaries that water crosses as it flows downstream and asks the question of can we work together to reach a more sustainable and equitable future that includes healthy rivers.

We hope that this issue challenges and encourages you to think more expansively about opportunities to identify and work together with anyone who has an interest in achieving a more sustainable water future that includes healthy rivers. Consider the articles in this issue a mere sampling of content on this topic. Beyond these articles, check out the integrated water management resources on our website, including webinars and links to interesting recent publications.

HERE ARE A FEW OTHER IMPORTANT ANNOUNCEMENTS FROM YOUR FRIENDS AT RIVER NETWORK:

- Register for River Rally 2017! Check out this year's program and join us in Grand Rapids May 8–11.
- Get 25% off River Rally and other perks by becoming or renewing your membership.
- Check out our recent webinar, Water in a Post-Election World: What are the Implications.
- Sign-up for our upcoming webinar series on nonprofit financial management.

We look forward to seeing many of you in Grand Rapids, MI!

Nicole Silk, President
River Network

INTEGRATED WATER MANAGEMENT–HOW WE GOT HERE AND WHERE WE'RE HEADED

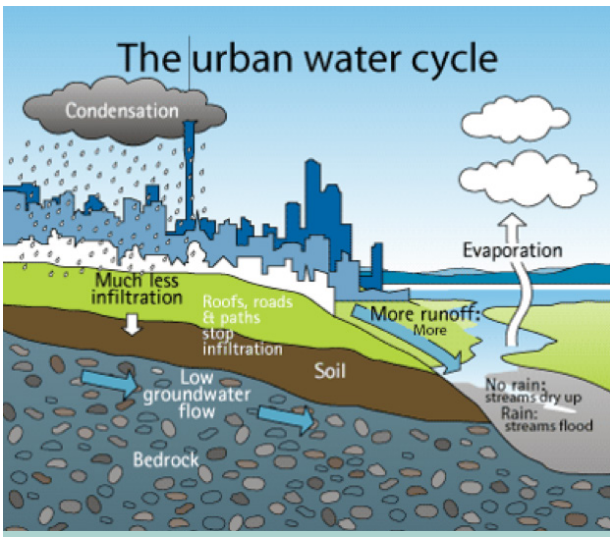
by Lynn Broaddus, President, Broadview Collaborative, Inc. and Chair, River Network Board

If you're reading this, chances are you care about water, and you probably especially care about surface water—the water that runs through our lives as streams and rivers, bringing both personal enrichment and fundamental economic health to our communities. In past decades, those of us who focused on managing, protecting, and even restoring those waters often ran headlong into institutional walls and found ourselves pegged as troublemakers or soft-headed idealists who obstructed progress. But today, more and more communities are trying to take a more holistic approach to water management, recognizing that the most robust strategies require integrating multiple perspectives.

The concept of "Integrated Water Management" (IWM), sometimes also referred to as "Integrated Water Resources Management," has been around for many decades, and means different things to different people. In the **international context**, where development of large projects like dams and fundamental access to clean water are major concerns, it tends to refer to ensuring equitable access to water, and protection of water quality. In the United States, however, it is generally used in the context of urban water management, and especially the incorporation of "green" or sustainable practices. Whether at the international or local level, some common elements to this approach include:

- Working across disciplines, departments and political and watershed boundaries.
- Seeking multiple benefits—economic, social and environmental—both upstream and down.
- Restoring natural hydrology and considering all water (whether drinking water, stormwater or wastewater) as water.
- Engaging and listening to a broad range of community members as part of the decision-making process to ensure equitable outcomes.
- Considering and planning for the impacts of climate change.
- Looking for opportunities that are restorative, regenerative and flexible as opposed to linear, wasteful and rigid.

To better understand IWM, I find it helpful to look backwards to see how it evolved to what it is today, and then project forward to what it might be in the years ahead. IWM, as most of us encounter it in our civic and professional work, comes from the need to better manage rainfall in urban areas. As cities grew, (a phenomenon made possible by revolutions in how we handle sewage, but that's a water topic for another day!) the landscape hardened. Whereas in the past rainfall would be largely absorbed and slowed down by soil, wetlands, tree canopies, and expansive floodplains, the explosion in roads, rooftops, and parking lots that we experienced in the last century left water with few options.

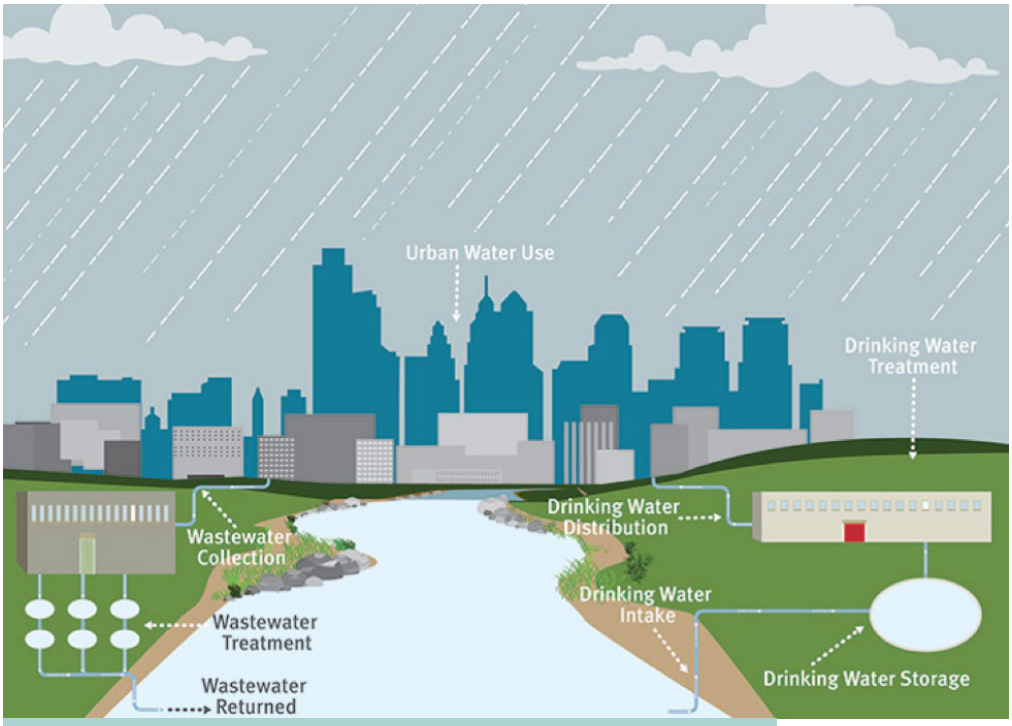


The Urban Water Cycle (Source: Auckland Council)

To deal with the flooded streets and overwhelmed urban streams, in the 1950s through the 1970s "modern" techniques were applied to help get rid of water as efficiently as possible. This meant straightening streams into ditches, often concrete lined, or even burying them in underground pipes. But as so often happens, solving one problem led to many others. Thinking of water only in terms of "drainage" ignored what happened downstream. Water was moving off the land into rivers and streams faster, causing higher floods downstream. The force of this faster water eroded streambanks, which in turn impaired water quality while also threatening the stability of bridges, railroad tracks, and other nearby structures. Ironically, because the path to groundwater recharge was cut off, in dry times the baseflow of streams and rivers dropped.

By the 1970s something clearly needed to change. The practice of **detention and retention basins** was adopted as a way to ameliorate flooding and, to some extent, address water quality concerns. This was a start, but was more useful in newly developing suburban contexts than in densely developed urban areas. Urban areas, especially those with combined sanitary and stormwater sewers, had the added challenge of sewer backups and overflows, triggering violations of the Clean Water Act and the accompanying citizen outrage. The traditional way to address this has been to build wider pipes and bigger detention facilities, and in some communities these would need to be underground "deep tunnels." Again, this solves the problem but creates many new ones: extremely high cost to ratepayers, higher energy demand (because of required pumps) which in turn means higher operating costs and increased greenhouse gas emissions, disruption during multi-year construction phase, and potential **damage to structures** above the tunnels. Although these solutions were essentially supported by clean water policies based on earlier understanding of stormwater control, basically, trying to build one's way to solving urban stormwater problems becomes a spiraling challenge, with ever-growing costs to citizens.

Fortunately, there's a better way. By integrating green and low-impact practices into the urban fabric, cities are finding that they can treat water in place while also solving other problems and bringing unexpected benefits: green roofs that also ameliorate urban heat island effects, permeable playgrounds that dry out quickly, rain gardens and bioswales that beautify communities, and **rain barrels** that provide a free source of water that doesn't have to be pumped and treated by the municipal system. More and more communities as well as private developers are adopting these practices, as you'll read in the following articles.



Urban Water infrastructure diagram (from City of Philadelphia Water Utility)

While these practices are welcome updates, we still have a long way to go. Even in the most forward-thinking communities, green stormwater practices are only applied to a small fraction of the landscape than many of us would eventually like to see. And there are many places, especially in smaller communities, that still view anything "green" with suspicion.

But we can't stop with only addressing stormwater. True integrated water management will need to look beyond regulatory mandates to embrace a systems approach to resource management that includes water as a central figure. For instance, communities are facing increased regulatory pressure to produce cleaner water from sewage treatment plants. It's technologically feasible to make the water as clean as anyone wants it, but at what cost, and at what level of energy consumption? Instead, a growing number of facilities are adopting **phosphorus recovery** practices which provide cleaner water as well as commercial products that can provide revenue for the utility while also generating local sources of phosphorus fertilizer. We should expect processes for viable nitrogen recovery technologies soon. Elsewhere, facilities are harnessing biodiversity's power by using **wetlands** and bivalves for a "passive" (low energy input) method to clean emerging contaminants from effluent.

Integrated approaches also incorporate water conservation. Even communities with abundant water need to find pathways to conservation so that they can save on energy and chemical inputs, all of which have indirect impacts on water. There may even be a time in the not-so-distant future where homeowners and businesses go "off-grid" for their water, realizing that by **harvesting the water** that falls on their roof they can avoid the costs of an expensive urban infrastructure while also having personal control over their water. Similarly, approaches like **Net Blue** that link land use with water supply to achieve water neutral community growth will be important.

Perhaps the places we're most likely to see leading the way on integrated water thinking are those which have outgrown their water supply and are looking to "new" sources like on-site rainwater harvest, storing rainwater in urban aquifers, and even **reusing the water** recovered from sewage treatment directly back into their water supply systems. These practices can't help but make us attentive to what goes into the water in the first place.

But none of them happen without people like you, and the citizens you engage, demanding the change that they want to see. Sometimes this work can be frustrating, especially in the context of outdated regulatory frameworks that can make utilities skittish about new practices. But in the end, by thinking broadly, listening deeply, and setting high standards, local advocates can be the most essential tool to integrating our water management.

LEARN MORE

- River Network Webinar recording ***Introduction to Integrated Water Management***—What is it and how can it Benefit Your Community, featuring Lynn Broaddus and Teresa Conor, One Water Solutions Institute, Colorado State University
- Mayors Innovation Project **Integrated Water Management**
- **River Network, Integrated Water Management**
- Integrated Water Management workshops at **River Rally 2017** in Grand Rapids, MI, May 9–11 including: Local Applications of IWM in Milwaukee, Atlanta and Boston.
- **River Network's National Rain Barrel Program** is an easy way to start introducing people in your community to the concepts of rain water harvesting and IWM.

SAN FRANCISCO'S NON-POTABLE WATER PROGRAM: FROM PILOT TO POLICY

Paula Kehoe, San Francisco Public Utilities Commission, San Francisco, CA

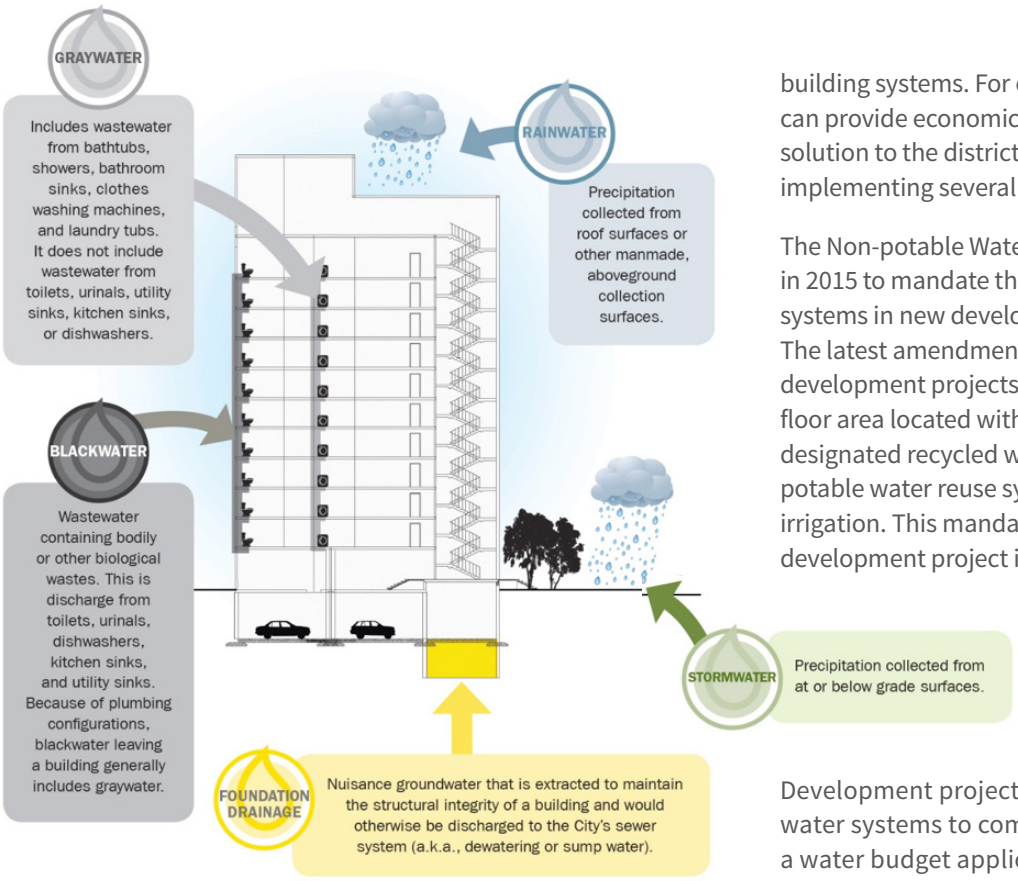
INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) is a leader in reducing water demand and diversifying supplies to protect against drought and the effects of climate uncertainties. Recently, the city has continued to innovate by integrating the use of non-potable water into its water systems. SFPUC is a department of the City and County of San Francisco, California, that provides retail drinking water and wastewater services to San Francisco, 100% greenhouse gas free power to San Francisco's municipal departments, electrical service to select local residential and business communities, and wholesale water to 27 cities, water districts, and private utilities within three neighbouring counties. The SFPUC operates the Regional Water System, which delivers water from the Hetch Hetchy watershed in Yosemite National Park west to San Francisco, serving over 2.6 million customers along the way. In 2008, the SFPUC adopted an ambitious goal of developing an additional 10 million gallons per day (mgd) of local water resources in lieu of additional drinking water supplies from the Regional Water System. To achieve this goal, the SFPUC expanded its conservation program and began to develop local recycled water and groundwater sources within the city limits of San Francisco. San Francisco's residential per capita is one of the lowest in California and approximately half the average in the state.

To demonstrate the SFPUC's commitment to water efficiency and innovation in water reuse and wastewater treatment, the SFPUC incorporated two separate non-potable water systems in its new headquarters building, in 2012. When combined, the two non-potable water systems reduce the building's potable water usage by approximately 60%. The rainwater harvesting system captures and treats rainwater and stormwater in a 25,000 gallon cistern and reuses it for landscape irrigation. The building's constructed wetland system (the **"living machine"**) treats up to 5,000 gallons of wastewater per day using a series of tidal and vertical flow wetlands. The treated wastewater from the wetlands system is used for toilet and urinal flushing throughout the building. The SFPUC selected the constructed wetland technology due to its ability to treat the wastewater and aesthetics.

NON-POTABLE WATER ORDINANCE

At the same time the onsite water systems were constructed at its headquarters building, the SFPUC also began developing its Non-potable Water Program in collaboration with the San Francisco Department of Public Health (SFDPH) and the San Francisco Department of Building Inspection (SFDBI). The Program allows for the collection and treatment of rainwater, stormwater, foundation drainage, graywater and blackwater for non-potable applications, such as toilet flushing.



Alternate Water Sources Available On-site, SFPUC

As a result, the *Onsite Water Reuse for Commercial, Multi-Family and Mixed-Use Developments Ordinance*, also known as the **Non-potable Water Ordinance** was added to the San Francisco Health Code in 2012. The ordinance allows the collection, treatment, and use of alternate water sources for non-potable applications and established a regulatory structure for the administration and approval process, outlined roles and responsibilities for three City agencies, set application and annual fees for SFDPH, and provided the ability to impose penalties enforceable by SFDPH.

In 2013, the ordinance was amended to allow district-scale non-potable water systems in San Francisco, where a district is defined as two or more buildings sharing non-potable water. The establishment of district-scale water systems added a fourth agency, the San Francisco Department of Public Works (SFDPW), to the City's collaborative implementation process. SFDPW works with district-scale projects to obtain encroachment permits to install pipes in the public streets or sidewalks. While water reuse is often considered at the building level, district-scale non-potable water systems offer significant benefits in comparison to individual building systems. For example, district-scale projects can provide economic benefits by offering a centralized solution to the district's treatment system, rather than implementing several single-building treatment systems.

The Non-potable Water Ordinance was further amended in 2015 to mandate the installation of non-potable water systems in new developments meeting specified criteria. The latest amendments to the ordinance require all new development projects of 250,000 square feet or more of gross floor area located within the boundaries of San Francisco's designated recycled water use area to install and operate non-potable water reuse systems for toilet and urinal flushing and irrigation. This mandated requirement expanded to any new development project in San Francisco as of November 1, 2016.

Development projects that must install non-potable water systems to comply with the ordinance must submit a water budget application to the SFPUC to assess the amount of rainwater, graywater, and foundation drainage produced onsite, and the planned toilet and urinal flushing and irrigation demands. If the available supply from rainwater, graywater, and foundation drainage produced onsite exceeds the demands for toilet and urinal flushing and irrigation, 100% of those demands must be met by using these available alternate water sources. If the available supply from rainwater, graywater, and foundation drainage produced onsite is less than the demands for toilet and urinal flushing and irrigation, 100% of these available onsite sources must be used for toilet and urinal flushing and irrigation.

WATER QUALITY REQUIREMENTS FOR ONSITE WATER REUSE SYSTEMS

All onsite water reuse systems in San Francisco must be in compliance with local regulations including Article 12C of the San Francisco Health Code, as well as state regulations such as the California Plumbing Code (CPC). The SFDPH Rules and Regulations are consistent with available state regulations and provide additional water quality criteria for alternate water sources or non-potable applications that are not addressed in the state code. All systems, with the exception of subsurface irrigation with rainwater and graywater, are required to monitor water quality parameters.

SFDPH also developed a monitoring and reporting regime to ensure proper operation of the non-potable systems after construction. This includes a graduated monitoring regime based on source water and includes two use modes: conditional start-up mode and final use mode. During conditional start-up mode, the alternate water source is treated and supplied to the approved non-potable applications. Frequent monitoring is required as the operation of the system is further refined. The system must be operated in conditional start-up mode for at least 180 days. After satisfying all conditional start-up mode requirements, the system is put into final use mode and is required to do continuous monitoring, reporting, and system inspection.

GRANT ASSISTANCE PROGRAM

In addition to leading the administration of the Non-potable Water Program, the SFPUC also provides financial assistance to projects through its Grant Assistance for Large Alternate Water Source Projects. The grant program awards up to $250,000 for non-potable water projects that annually replace at least 1 million gallons of potable water for at least 10 years, or awards up to $500,000 for projects that annually replace at least 3 million gallons of potable water for at least 10 years. Since 2012 SFPUC has awarded six grant applications.

NATIONAL WORK TO INNOVATE URBAN WATER SYSTEMS

To scale up this work, in 2014, the SFPUC convened the *Innovation in Urban Water Systems* conference, bringing together a diverse group of water agencies, public health departments, and research institutions. The purpose was to discuss the barriers, opportunities, and research needs for non-potable water systems and was supported by the Water Research Foundation (WRF), the Water Environment Research Foundation (WERF), and the US Water Alliance. As a result of the conference, the SFPUC-led group drafted the *Blueprint for Onsite Water Systems: A Step-by-Step Guide for Developing a Local Program to Manage Onsite Water Systems.* The Blueprint was created to assist communities in developing local programs, managing the oversight of non-potable water systems, and protecting public health.

The national partnership continued its work by working with the National Water Research Institute to prepare a set of guidelines called ***Risk Based Framework for the Development of Public Health Guidance for Decentralized Non-potable Water Systems.*** The framework is intended to provide guidance to local agencies on water quality pathogen targets, monitoring regimes for water quality, management considerations for non-potable water systems, and strategies for permitting projects. San Francisco plans to incorporate elements of the framework into their Non-potable Water Program to create a more streamlined process for water quality monitoring.

In late 2016, the ***National Blue Ribbon Commission for Onsite Non-potable Water Systems*** was launched to advance best management practices to establish state and national frameworks to support the integration of onsite water systems and identify new business opportunities for water utilities across the country.

Overall, as SFPUC has shown, non-potable water use can be an important part of integrated water management to reduce demand on local freshwater resources when considered carefully and in coordination with local health and building agencies.

LEARN MORE

- San Francisco Public Utilities Commission, **Non-potable Water Program**
- ***Blueprint for Onsite Water Systems: A Step-by-Step Guide for Developing a Local Program to Manage Onsite Water Systems***
- *National Blue Ribbon Commission for Onsite Non-potable Water Systems:* **http://uswateralliance.org/initiatives/commission/**
- River Network Webinar recording **Water Scarcity as a Catalyst for Integrated Water Management**, featuring John Scarpulla, SFPUC discussing the non-potable program

SMART WATER MANAGEMENT SUPPORTS PEOPLE AND NATURE THRIVING TOGETHER

by Nancy Stoner, Pisces Foundation

The drinking water crisis in Flint, MI …continuing droughts and wildfires in the West and Southeast… flooding in Texas, North Carolina, and Iowa…harmful algal blooms closing Treasure Coast beaches in Florida …. While none of these impacts is new, they all demonstrate just how fragile our water systems are. The trends are headed in the wrong direction, driven by increased climate impacts to water resources and increases in stormwater pollution and sewer overflows from stronger and more frequent storm events. Compounding the challenge: as a nation, we have continued to underinvest in our decaying water-related infrastructure.

At the Pisces Foundation, we believe that when we transform how we value and use water, we'll know that our tap water is safe, our waterways are clean, we're using every drop efficiently, and farms can grow the food we need without polluting nearby water. But to make that vision real, we need a paradigm shift in how we manage water in this country. Instead of tackling water quantity challenges, water quality issues, and water infrastructure needs separately, it's time to focus on smart ways to make progress on all three at once.

The set of smart water solutions that Pisces Foundation supports is known as "integrated" or "one water" management. The common thread to these solutions is that they look at water holistically, treat all water as valuable, and manage water in conjunction with energy, climate, land use and other systems so as to provide multiple benefits for people and nature.

The goal of Pisces' water program is to guarantee safe, sufficient and secure water in our cities and on the farm. To succeed, we must leave behind outdated approaches and adopt new technologies that solve environmental and community problems while delivering economic benefits, too. That's why we are targeting our funding to four interconnected grant making areas—urban watersheds, cutting-edge agriculture, peer-to-peer networks and water-monitoring technology—that we believe will accelerate the move toward smart water solutions.

SMART WATER MANAGEMENT IN URBAN WATERSHEDS

Pisces is proud to support grantees working in seven U.S. cities who are facing a diverse set of water challenges and are reimagining water management with smart new approaches, like designing parks to capture rain runoff as a source of water. For example, Los Angeles is on track to meet **50 percent of its water needs locally by 2035** by using water more efficiently and reclaiming rainwater and wastewater. Despite tremendous population growth, L.A. uses the same amount of water today as it did 45 years ago and is cutting water pollution along its famous coastline. Tucson is working toward bringing dried-up desert streams back to life and replenishing its depleted drinking water aquifers by harvesting rainwater and using their water more wisely. New Orleans is using rainwater capture and infiltration to slow the rate at which the city is sinking and to prevent increased flood risk. Detroit is using rainwater capture and infiltration to reduce raw sewage overflows and to create jobs at the same time. The water challenges vary among the cities in which Pisces is investing, but the determination to overcome them using smart water management is common to them all.

PEER-TO-PEER KNOWLEDGE SHARING

There is a wealth of experience and knowledge to spread among the mayors, urban planners, city council members, water managers, sustainability managers, or watershed groups who champion smart water management. One of the most effective means of accelerating and scaling best smart water management practices is to make sure they are

sharing what they've learned with peers between and across cities. It's not always easy for them to communicate with each other, so peer-to-peer networks within and across professional disciplines in water can help break the silo-ization that otherwise occurs. And organizations such as River Network, **US Water Alliance**, **Green Infrastructure Leadership Exchange**, and **Water Now Alliance** are connecting cities that would like to implement new practices, but don't know how with urban watersheds that are smart water pioneers.

SUSTAINABLE SOURCING TO CUT AGRICULTURAL WATER POLLUTION

To reduce the dead zone in the Gulf of Mexico and reduce nutrient contamination to levels that are safe for people and nature, everyone—farmers, companies, policy makers, and consumers—needs to work together and make smarter water management decisions.

Solutions that work for farmers as well as the environment are available and demand is growing. Row crop farms in the Midwest are already increasing profits and reducing pollution using conservation tillage, cover cropping, and rotational grazing in innovative ways. Farmers can adopt these techniques to increase soil productivity and capture nutrients that would otherwise pollute waterways. Farms implementing these solutions see impressive results for the environment and for their bottom line.

At the same time, more and more consumers want sustainably raised food. Farmers and retailers know they can charge more for sustainably-grown products, and investors know that sustainably raised crops are more resilient to drought and other water-related risks. That's why purchasers of farm products and investors in agricultural businesses are increasingly interested in ensuring that their products meet sustainability criteria.

Pisces' ultimate goal, through the work of our grantees, is to persuade the agricultural sector and its business partners to learn about, talk about, and adopt solutions that reduce water use and water pollution. We believe the time is ripe for change. Major players in the food industry are adopting greenhouse gas reduction and other sustainability goals. Through the work of **Ceres** and the **World Wildlife Fund**, **seven major food brands committed** to reducing their water use and pollution using the results of a water risk assessment across their supply chains. **Field to Market** and other organizations are providing tools for meeting the new water-related sustainability criteria and trusted messengers to work with farmers to adopt those tools that will work best for their farm operations.

EMPOWERING THE PUBLIC WITH WATER MONITORING TECHNOLOGY

Even as cities and the agriculture industry adopt smarter water management, there are more places to save water than any one agency or organization can track and monitor. Fortunately, there are a wealth of emerging technologies, such as low cost sensors, smart phone applications, and remote sensing data from satellites that could make water professionals as well as engaged members of the public more effective in identifying problems and identifying and advocating for solutions. The challenge? Most of these technologies are not yet in widespread use. Our goal is to put technology into the hands of organizations that can use them to protect water resources—in their own backyards or nationwide. River Network is one of Pisces Foundation' partners in matching nonprofits with science and technology that can make them more effective in achieving their watershed goals.

At Pisces, we appreciate the opportunity to support great organizations like River Network and its member organizations to put new solutions in place so that we all have clean and abundant water to use and enjoy. If we act now and boldly, we can quickly accelerate to a world where people and nature thrive together.

LEARN MORE

- **Pisces Foundation water program**
- Pisces work on **low cost sensors and remote sensing**
- Technology to Advance Your Water Strategy & Goals workshop at **River Rally 2017** in Grand Rapids, MI, May 9–11 facilitated by Nancy Stoner

A NEW COLLABORATIVE IS WORKING TOGETHER ON INTEGRATED APPROACHES TO UPGRADING NEW JERSEY'S WATER INFRASTRUCTURE

by Elaine R. Clisham, New Jersey Future

New Jersey's water infrastructure is too big a problem for any one organization to fix. So lots of them decided to tackle it together.

On Dec. 2, 2016, 290 people got together at the New Jersey Performing Arts Center in Newark, N.J., to talk about water.

This was no ordinary meeting. It was the latest milestone in more than two years of work by a group of organizations in New Jersey to build a coalition of stakeholders to address the Garden State's aging and inadequate water infrastructure. It was the **second annual conference** presented by a new cross-sector collaborative called **Jersey Water Works**.

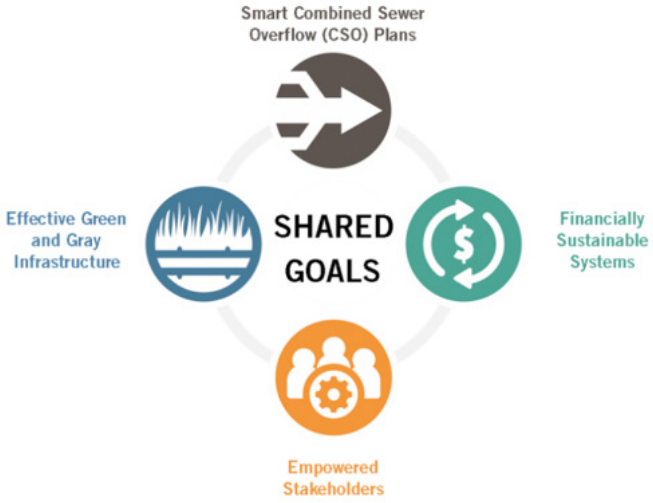
The idea for Jersey Water Works began in early 2014, when the land-use policy organization **New Jersey Future** published a **report** highlighting the problems that antiquated combined-sewer systems (CSSs) cause in the state's older cities and towns. From that report came a convening in May 2014, at which experts from a variety of affected sectors—elected officials, public and private utilities, state regulators, and community organizations—the first time many of the attendees had been in the same room with each other—laid out an ambitious **Agenda for Change** to address not just the combined-sewer problem, but the broader problem of New Jersey's old drinking water, wastewater and stormwater systems.

The Agenda recommended that investments in 21st century infrastructure investment live up to the following guiding principles:

- Strengthen Cities
- Enable Economic Growth.
- Leverage Modern Practices
- Reduce Flooding and Energy Use, and
- Draw on Multiple Funding Sources and Maintain Affordability

"It was very energizing to see people working across sectors to develop innovative approaches to tackling this enormous problem," said Mark Mauriello, a former commissioner of the state Department of Environmental Protection (NJDEP) and a co-chair of the Jersey Water Works collaborative. Building on the convening's momentum, New Jersey Future staff began engaging interested parties in quarterly meetings and project work, but quickly realized that a new approach was needed. "To achieve system-wide change, we needed a better way to offer shared leadership to our many new partners," said Chris Sturm, New Jersey Future's managing director for policy and water. "We moved to a **collective-impact approach** to make it easier for everyone involved to align their efforts in a common direction." At a **half-day conference** in December 2015—the inaugural Jersey Water Works Conference—the new collaborative was officially unveiled, along with its tagline, "Smart Infrastructure. Strong Communities."

A diverse 20-member Steering Committee was introduced and **12 shared goals** for 2016 were announced, ranging from enlisting the state Department of Transportation in supporting design and construction of green streets, to establishing guidelines for using parks to manage stormwater, to cultivating and engaging community members on water and green infrastructure issues.



Jersey Water Works Shared Goals Model

"A strong collaborative approach is the only way to achieve smart, sustainable water infrastructure investments on the scale needed, which the EPA estimates at $40 billion over 20 years," said Margaret Waldock, program director for environmental programs at the **Geraldine R. Dodge Foundation**, which has provided financial support for the initiative.

The organization is truly a collaborative. In 2016, working committees proposed their priorities for action based on the shared goals. Those priorities, taken together, became the collaborative's **work plan for the year**. Throughout the year there were monthly committee meetings, and a set of measures is being developed against which the collaborative will chart its progress. New Jersey Future acts as the "backbone" organization, handling administrative, financial and logistical functions for the collaborative.

One of Jersey Water Works' most pressing priorities is the state's need to address the combined-sewer systems that currently serve 21 of its cities. The NJDEP has issued new permits to the operators of these systems, requiring them to adopt and implement plans to reduce combined-sewer overflows—something that will take many years and billions of dollars in new investment. The collaborative is working to help find cost-effective and equitable ways to do this that will bring additional benefits to the affected communities—benefits such as installation of green infrastructure, which will make neighborhoods healthier and more resilient to a changing climate, ease pressure on the sewer systems, and offer jobs and job training to area residents.

The collaborative's efforts are already making a difference. To serve its combined-sewer permittee members better, it has established a new peer network to connect them across the state. "Convening CSO permit-holders allows us to learn from each other, and also share ideas on what kind of support we should seek from policymakers, regulatory agencies and other stakeholders," said permittee network co-chair Andy Kricun, who directs the Camden County Municipal Utilities Authority.

On the public-facing side, the collaborative's Community Engagement Committee is working with the NJDEP, utilities, and environmental and community organizations to refine the public outreach section of the new permits, to help ensure that all stakeholders are co-architects of their communities' water investments. "Water infrastructure projects will be among our cities' biggest public works expenditures, and community members must be involved to ensure that those projects are making our neighborhoods stronger and healthier," said Drew Curtis, the Community Development and Environmental Justice Director at the Ironbound Community Corporation in Newark.

On the drinking water side, its Best Practice Committee is preparing new modules for a popular municipal certification program on things like water loss audits and asset management. The collaborative hosts an ever-expanding repository of useful resources for anyone

interested in learning more about the state's water infrastructure, including information on the critical issue of lead in drinking water, and why new investment in it is necessary. Meanwhile, the Green Infrastructure Committee has released **recommendations** for designing and using parks with green stormwater infrastructure to reduce combined sewer overflows and flooding.

Media in New Jersey have begun to take notice, too. The policy-oriented online news site **NJ Spotlight** and the state's public-television news programs, **NJTV News** and **New Jersey Capitol Report**, have all highlighted the establishment of the collaborative and its 2016 work plan. Collaborative members were **invited to testify** at the first meeting of the state's newly appointed Joint Legislative Task Force on Drinking Water Infrastructure, drawing significant **media coverage**.

The recent conference was in many ways a celebration of a very successful first year for the collaborative, as well as a preview of the work to come in 2017. At that conference, the group celebrated the accomplishments of its five committees. And more than 30 member individuals and organizations committed publicly to take a variety of actions in the coming year—from releasing an app to allow residents to report rain-related flooding to developing a city's first-ever water infrastructure capital improvement plan to declaring a "Year of Water"—intended to improve water infrastructure in New Jersey.

"It is extremely gratifying to see so many organizations, from such a range of industry sectors, step forward in these meaningful and innovative ways to address the crisis in our water infrastructure," said Jane Kenny, a former regional administrator for the U.S. Environmental Protection Agency and a co-chair of the collaborative. Capping off this highly successful first year, on Dec. 7 the collaborative was presented with the **2016 Governor's Environmental Excellence Award** in the Water Resources category.

"The scope of the water problem in New Jersey is enormous," said Christie Todd Whitman, the former New Jersey governor and U.S. Environmental Protection Agency administrator and an honorary co-chair of Jersey Water Works, who delivered welcoming remarks at the collaborative's summer membership meeting. "No one organization can fix it alone. But … look at the difference the collaborative has made already.

"You are all influencers, with the ability to motivate," she concluded. "Congratulations and don't give up!"

LEARN MORE

- Jersey Water Works full list of **2017 commitments**
- River Network Integrated Water Management Webinar featuring New Jersey Future's Chris Sturm on **Sewage Pollution as a Catalyst for Integrated Water Management**

RESILIENCE: NOT JUST FOR RIVERS

Jeremy Diner, American Rivers

Photo credit: Turner Field Stadium Neighborhoods Livable Centers Initiative

WHAT'S IN A RIVER?

That which we call a river, by any other name, would still be a bunch of water, critters, nutrients and pollutants flowing downhill. Some people see a river and feel a sense of peace and relaxation. Others may see a drainage canal. A highway engineer may see a barrier to transportation while a boat captain sees a means of transportation. An ecologist sees a hotbed of biodiversity. Still others may see the entire footprint of our civilization, as the rain touches every bit of the landscape before joining forces as a river. Indeed, a river is all of these things.

To ensure that rivers continue to provide these important services, we must recognize all the benefits of water, and acknowledge that trade-offs occur as society marches forward. The recognition of these trade-offs and the distribution of benefits is often referred to as integrated water management.

Integrated water management has been described as pragmatic, adaptive, elastic, holistic, essential, costly, time consuming, challenging, unwieldy, a welcome aim, a Nirvana concept, and accepted internationally as the way forward. [1, 2] Despite this amorphousness, most practitioners agree on a few core principles, including:

- Water should be managed in a less fragmented manner,
- Improved collaboration is at the heart of an integrated strategy, and
- The end-goal is to improve the environmental, social, and economic conditions in an equitable and sustainable manner.

[1] http://www.water-alternatives.org/index.php/volume3/v3issue1/77-a3-1-4/file

[2] http://www.un.org/waterforlifedecade/iwrm.shtml

American Rivers is focused on implementing practical approaches to integrated water management which build on these core principles. Whatever you call it, many of us practice integrated water management every day. As we move toward a more diverse, equitable, and inclusive approach to river management, the 'improved collaboration' component shines brightest. What does it take to improve collaboration with socio-economically diverse communities? How can we truly help amplify these voices?

These questions are informing our advocacy for green stormwater infrastructure around Turner Field, former home of the Atlanta Braves.

BEYOND THE BRAVES: THE FUTURE OF TURNER FIELD

The historically black neighborhoods surrounding Turner Field have endured decades of infrastructure-driven injustices. Projects such as interstate highways and stadiums have transformed a once-thriving neighborhood into a vast sea of parking lots and roads, displacing residents, small businesses and jobs, and causing major flooding in residential neighborhoods immediately downstream.

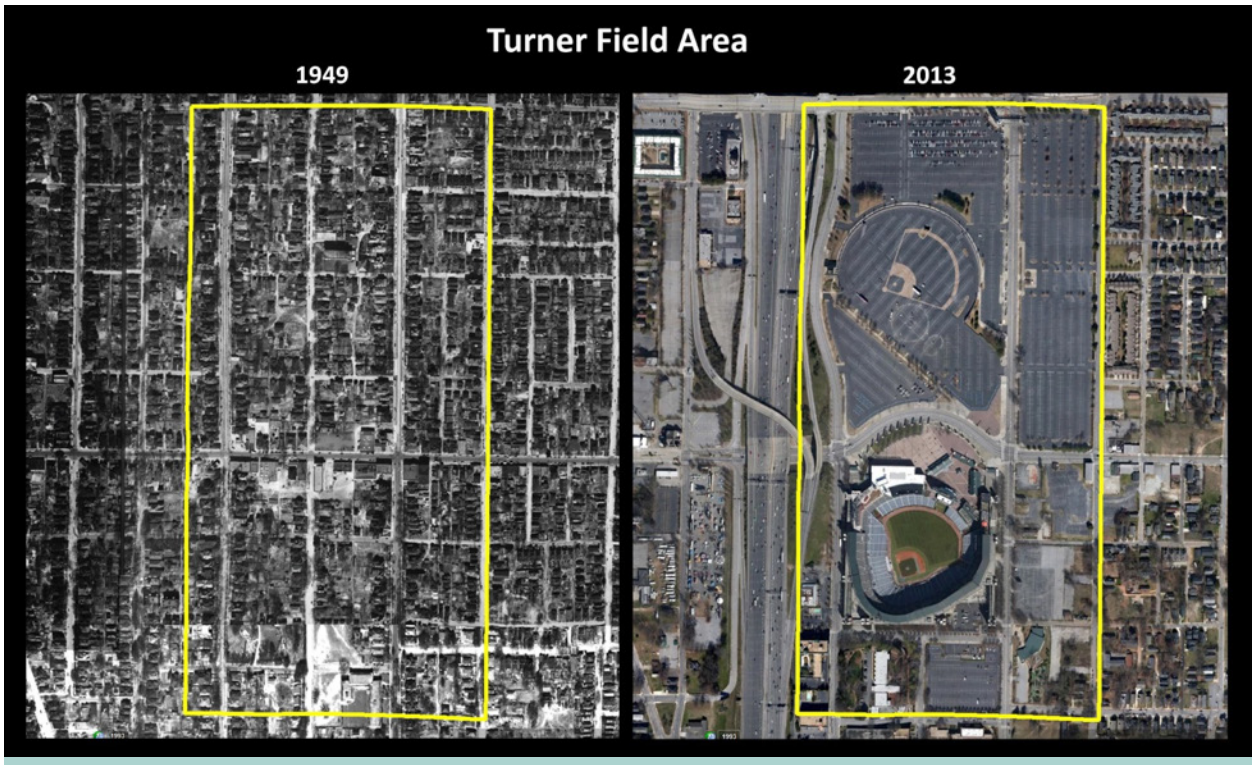


Photo credit: Atlanta Historic Block Party

In the wake of the Braves' exodus, the Turner Field Community Benefits Coalition (TFCBC) surveyed almost 1,000 neighborhood residents, and determined that "A well-integrated, mixed use development" tops the list of community desires. The #1 answer to the question, "The New Development Should…" was "…manage stormwater."

After discussing these results with the TFCBC, American Rivers considered how **the benefits of green stormwater infrastructure** (essentially, using plants instead of pipes to manage rainfall) could address several of the community's top priorities beyond just managing stormwater. From there, American Rivers joined a highly anticipated visioning process known as the **Livable Centers Initiative** and spent the next

few months attending meetings and workshops, speaking with urban planners, transportation engineers, community groups, water professionals, and various government entities. We conducted research across the country to demonstrate what others are doing, and then we developed **two feasibility** assessments for green stormwater infrastructure implementation as part of the Livable Centers Initiative vision.

WATER COMMUNITIES

Here, **ECO-Action** enters the story. ECO-Action is a local non-profit focused on issues of environmental justice, and an active member of the TFCBC. American Rivers partnered with ECO-Action to develop a course for community members—the Watershed Advocate Training for Empowered and Resilient Communities, or, WATER Communities. We held monthly meetings which included lectures and discussion led by expert speakers on subjects ranging from infrastructure and environmental justice to advocacy and community organizing. As Turner Field is redeveloped, it will be crucial to have many advocates standing strong for their neighborhood.

Photo Credit: American Rivers

Today, several months after the conclusion of the WATER Communities course, the trainees continue dialogue amongst themselves and are organizing to discuss the best ways to apply the knowledge they received during this course. American Rivers, along with ECO-Action and a WATER Communities graduate, will share more about this training model during the 2017 River Rally workshop, *Equitable Urban Planning for Resilient Communities*.

ONE POINT EIGHT INCHES

One point eight inches. I've probably said those words a thousand times. Nothing reflects the integrated nature of this project like that little number. After all the listening and talking and research, American Rivers recommended that the first 1.8" of rainfall should be retained onsite (as opposed to sending it offsite and downstream to cause flooding and pollution as described in Lynn Broaddus' article)—an ambitious, yet feasible amount equivalent to 95% of all 24-hour storms that hit Atlanta in an average year. Onsite retention standards don't require green stormwater infrastructure, but they drive the use of it. It isn't perfect, but it goes well beyond the City of Atlanta's 1.0" onsite retention requirement.

This performance metric made economic sense based on common building standards, meaning that it's flexible enough to dovetail with LEED green building or **Sustainable Sites Initiative** (SITES) requirements. Our recommendations would reduce the volume of runoff by 3.4 million gallons per storm in this flood-prone neighborhood. Then we began to share the results with stakeholders. The planners thought it was too much—would it be too costly or take up too much space? The community representatives thought it wasn't enough—how much would this actually help the flooding? No one thought it was just right. Over time, as we discussed the pros and cons of green stormwater infrastructure, people on all sides came to embrace, or at least accept, this recommendation. Ultimately, the Livable Centers Initiative, the City of Atlanta and the TFCBC endorsed it. The Georgia Department of Transportation is currently using the 1.8" performance standard in a voluntary pilot project just uphill of the redevelopment site. City Council members even requested language to include this performance standard in the draft rezoning legislation for the area.

Throughout our early work using the integrated water management framework, American Rivers has been exploring what this concept can teach us. How can it make us better at protecting and restoring rivers? What should we be doing differently? This experience suggests that we start by breaking out of our own silos. We free up more evenings to attend community meetings. We trade our keyboard for a telephone or a handshake. We listen more and talk less. We practice more humility and patience.

If we can do these things, we'll be on our way to a new answer to the question: What's in a river?

That which connects us.

LEARN MORE

- American Rivers' **Integrated Water Management Resource Center** provides a framework for those seeking to practice integrated water management
- American Rivers' **The City Upstream and Down** publication detailing key takeaways for cities from national leaders on integrated water management.
- **Turner Field Community Benefits Coalition**—website for the primary community group advocating for equitable and inclusive development at Turner Field.
- Equitable Urban Planning for Resilient Communities workshop at **River Rally 2017** in Grand Rapids, MI, May 9–11

river NETWORK
connecting people · saving rivers

MISSION, VISION, AND FOCUS

River Network empowers and unites people and communities to protect and restore rivers and other waters that sustain all life. We envision a future of clean and ample water for people and nature, where local caretakers are well-equipped, effective and courageous champions for our rivers. Our three strategies for focused investment are strong champions, clean water, and ample water.

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