Basin Stories:

A vision for San Francisco

About the IWA Basin Action Agenda

The IWA Basin Action Agenda aims to influence and activate utilities, cities and their industries to become water stewards working with basin and catchment organisations, as well as other water management stakeholders (e.g. agriculture and mining). The Action Agenda is a call to action to support the Principles for Water Wise Cities through the level of Basin Connected Cities, and the associated principles including: (1) Plan to secure water resources (2) Protect the quality of water resources, and (3) Prepare for extreme events. The Action Agenda has outlined pathways on how urban stakeholders can achieve these principles. For more information visit: http://www.iwa-network.org/projects/basin-action-agenda/

About the Basin Stories

The basin stories are documenting some of the best practices and approaches that demonstrate how stakeholders especially those in urban areas (e.g. city government, water and wastewater utilities, industries) are taking part or contributing to sustainable management of water resources. Greater basin-level collaboration from catchment to consumer is essential for sustainable water management in the face of growing demand on water resources and global change. The stories aim to inspire urban stakeholders to be aware and respond to what is happening in their watershed.

OneWaterSF-Holistic water management from downtown San Francisco to Sierra Nevada

Contributed by: Paula Kehoe, SFPUC

The San Francisco Public Utilities Commission (SFPUC) provides high quality, efficient, and reliable water, power, and wastewater services to millions of people but are faced with key challenges from natural disasters and climate variabilities such as severe flood and droughts. As response to these challenges, 'OneWaterSF' was established as an integrated planning and implementation approach to manage water resources for long-term resiliency and reliability, meeting both community and ecosystem needs. This approach is a move away from operating within traditional water, wastewater, and energy boundaries to more holistic resource management. Some highlights of the OneWaterSF accomplishments include taking advantage of local water supply through groundwater projects, rainwater harvesting and water recycling. The learning opportunities from this program can also help cities transition to developing projects and programs that provide multiple benefits, conserve resources and promote ecosystem health.

Problem:

- Climate change (floods and droughts)
- Natural disasters (Earthquake and wildfires)
- Population growth

Geographic information

Country: USA

City population: 860,000

Water Service to 2.7 million

Basin area: more than 75,000 square miles

Solution:

An integrated planning and implementation approach to managing finite water resources for long-term resiliency and reliability, meeting both community and ecosystem needs.

Problem

The San Francisco Public Utilities Commission (SFPUC) is responsible for providing drinking water and wastewater services directly to customers in San Francisco (SFPUC, 2018). In addition, they provide wholesale water service in three Bay Area counties, and emissions-free power to San Francisco's municipal departments and other customers. The utility aims to provide services which are not only efficient and reliable but also ensure sustainability. The onset of climate uncertainties remains a major challenge to their operations. Frequent and severe droughts in California threaten the stability of existing water supplies, and intense storms overwhelm the sewer system. There are also natural disasters such as earthquakes or wildfires in the surrounding watersheds which means it is necessary to plan for disruptions in service that may occur due to these disasters. This has resulted in a decline in water quality and increased demand for limited water resources.

Solution: OneWaterSF

The San Francisco Public Utilities Commission (SFPUC) has cultivated a shift in thinking about water and energy resource management. As response to these complex challenges, 'OneWaterSF' was established as a guiding approach for integrated water resource management. This approach is a move away from operating within traditional water, wastewater, and energy boundaries to more holistic resource management.

San Francisco has implemented many reforms and innovations in the urban space with regards to water management, household water saving, wastewater recovery for irrigation, and public awareness raising. The scope for sustainable water management, however, exceeds the city boundaries. Both upstream and downstream catchment areas are included in the strategic planning and management of water supply and nature conservation through the 'Watershed and Environmental Improvement Program' (WEIP).

The WEIP is a long-term, landscape-level, and ecosystem-based strategy guiding the management of watershed activities. The goal of the WEIP is to protect and restore lands and natural resources that affect or are affected by the operation of the SFPUC water supply system. Although the highest priority for the WEIP is to permanently protect watershed lands, the programme is also involved in enhancing public awareness of watershed resources, their protection, and restoration. This process includes stakeholders in the catchment for example providing education opportunities related to water quality, water supply, conservation and environmental stewardship issues.

SFPUC also investigates how their nutrient-rich bio-solids from wastewater processing can be fed back into soils. Bio-solids provide nutrients for plants to grow, and also help the soil to absorb and store water. Adding this side product from wastewater treatment to the ground (e.g. on farm land or plantations) is a good source of fertilizer, while at the same time a way to combat climate change and making California more resilient to droughts.

Lessons learned

The SFPUC tested various projects and programs, or initiatives, through a OneWaterSF lens to begin developing a framework and help plan for subsequent years of implementation.

The OneWaterSF Vision and Guiding Principles serve as the foundation for developing and implementing projects and programs that advance OneWaterSF. With the OneWaterSF initiatives, silos are broken down and collaboration is encouraged both within the SFPUC and externally through partnerships with industry, academia and the community. The learning opportunities can also help cities transition to ecologically friendly water, food, energy, and waste systems. The following are highlights of three OneWaterSF accomplishments (OneWaterSF, 2018):

1. Taking Advantage of High-Quality Local Supply.
With 85 percent of water supply located over 250 kilometers away; the SFPUC recognized the value of both local water supplies and high quality groundwater located within San Francisco. The San Francisco Groundwater Supply Project reduces dependence on the regional water system and supplements our surface water supplies on a local scale. A second groundwater project, the Regional Groundwater Storage and Recovery Project, will enhance water reliability during periods of drought by providing additional groundwater to San Francisco and neighboring communities when it is needed the most.

2. Re-thinking Rainfall.
Rainwater Harvesting from small rain barrels to large cisterns, reduces potable water for irrigation and helps reduce runoff from entering the combined sewer system during storm events. Additionally, the San Francisco Storm Water Management Ordinance, the SFPUC encourages green infrastructure and design into residential and commercial development projects.

3. Reducing Potable Water with Water Recycling.
Water is too precious a resource to use just once. Treated effluent from the water treatment and recovery plants offers a new water source for various purposes. The SFPUC is moving ahead with centralized and decentralized water treatment systems to collect wastewater and graywater for non-potable applications such as toilet flushing and irrigation. With growing scarcity of water, and wet years interspersed with extended periods of drought, the SFPUC is advancing the science of purified water with a pilot project that takes treated wastewater from within the

SFPUC headquarters and further treats it to meet drinking water standards with advanced technologies.

In the future, expanding the vision of the OneWaterSF, promoting the use of technology and matching the right resources to the right use are the strategic focus areas of this new approach. In spite of the numerous challenges ahead SFPUC is committed to implement new opportunities for utilizing and managing our finite water and energy resources.

The OneWaterSF Vision and Guiding Principles serve as the foundation for developing and implementing projects and programs that advance OneWaterSF. This approach collectively improves communication amongst stakeholders bringing about innovative solution to maximize efficient use of resources. Some highlights of the OneWaterSF accomplishments include taking advantage of local water supply through groundwater projects, rainwater harvesting and water recycling. The learning opportunities from this program can also help cities transition to ecologically friendly water, food, energy, and waste systems.

In the future, expanding the vision of the OneWaterSF, promoting the use of technology and matching the right resources to the right use would be the strategic focus areas of this new approach. In spite the numerous challenges ahead SFPUC is committed to implement new opportunities for utilizing and managing our finite water and energy resources.

What are the Drivers for Action?

For more information on the Drivers for Action visit the Action Agenda for Basin-Connected Cities

Extreme Events	**Declining water quality**	**Water availability**
☒Public health hazards	☒ High operating costs	☒ Water supply disruption
☒ Damage to infrastructure	☐ Loss of credibility and trust	☒ Constraints to growth
☐ Economic activities and supply chain disruption	☒ Environmental, cultural and health impacts	☒ Declining quality of life

Pathways for Action

For more information on the Pathways for Action visit the Action Agenda for Basin-Connected Cities

Assessment	**Planning**	**Implementation**
☐Investment in data & information systems	☒ Risk-based approach to planning	☐ Integration of natural infrastructure
☐ Linking traditional water management with science	☒ Water allocation mechanisms	☒ Economic and financing mechanisms
☐ Invest in values to motivate water decision-making	☒ Stakeholder participation in planning and management	☒ Building partnerships from catchment to tap
	☒ Aligning urban development with basin management	☐ Digital Technologies

Resources

WEIP Annual Report FY 2015-2016:
http://www.sfwater.org/modules/showdocument.aspx?documentid=10020

OneWaterSF – 2017 Initiatives: https://view.joomag.com/onewatersf-onewatersf-2017-initiatives/09549400015246861O7?short

OneWaterSF – 2018 Initiatives: https://view.joomag.com/onewatersf-2018-initiatives/0532177001490224577

San Francisco Water Power Sewer: http://www.sfwater.org/index.aspx?page=1091

EPA: https://www.epa.gov/sfbay-delta/about-watershed

San Francisco Water Power Sewer 2018, SFPUC Water and Wastewater Cost of Service Study:
https://sfwater.org/modules/showdocument.aspx?documentid=12072

About San Francisco Public Utilities Commission (SFPUC)

The San Francisco Public Utilities Commission provides retail drinking water and wastewater services to the City, wholesale water to three Bay Area counties, and green hydroelectric and solar power to the municipal departments of San Francisco. Find out more here: https://www.sfwater.org/