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April 28, 2023

The Honorable Tommy Waters
Chair and Presiding Officer
and Members
Honolulu City Council
530 South King Street, Room 202
Honolulu, Hawai'i 96813

Dear Chair Waters and Councilmembers:

SUBJECT: One Water Honolulu 2022 Annual Report

In accordance with the Revised Ordinances of Honolulu (ROH) 2021 §2-10.13(b)(7), the Office of Climate Change, Sustainability and Resiliency (CCSR) hereby transmits the attached report detailing the City Administration's efforts of the One Water Panel and implementation of the City's climate change adaptation one water policy (ROH §2-10.13(b)) through Calendar Year 2022.

The City's One Water policy framework exists to increase proactive collaboration amongst City departments towards the holistic, efficient, and effective management of integrated water resources. The One Water policy recognizes the unprecedented challenges that climate change presents to our water resources and infrastructure, and sets forth principles and procedures to maximize resource sharing and innovative solutions in the face of climate change risks.

Should you have any questions, please feel free to contact me at (808) 768-2276 or via e-mail at matthew.gonser@honolulu.gov.

Sincerely,

Digitally signed by Gonser, Matthew
Date: 2023.04.28 13:51:27 -10'00'

Matthew Gonser
Executive Director and
Chief Resilience Officer

Attachment

APPROVED:

Michael D. Formby
Managing Director

MAYOR'S MESSAGE 86

# ONE WATER HONOLULU

## 2023 Annual Report

With support from: One World One Water, LLC

# About One Water Honolulu

## Vision Statement

**One Water Honolulu** champions cost-effective and climate-resilient infrastructure services for the people, culture, and sustainability of O'ahu through integration and innovation in planning, implementation, and maintenance.

## About One Water Honolulu

Ordinance 20-47 defined a climate change adaptation one water policy for the City and County of Honolulu (City) and established an eight-agency One Water Panel to carry out and implement the policy. This One Water policy is Revised Ordinances of Honolulu (ROH) 2021 §2-10.13(b). Per ROH §2-10.13(b)(7), the Office of Climate Change, Sustainability and Resiliency (CCSR) annually reports to the Honolulu City Council efforts of the One Water Panel and implementation of the policy.

The policy defines principles, procedures, and a coordination framework for the City to address growing climate change impacts and adaptation opportunities. The City's efforts of "One Water Honolulu" aim to create resource and financial efficiencies in the face of changing natural and urban water cycles by managing stormwater, wastewater, groundwater, seawater, freshwater, graywater, and recycled water as one "integrated resource." Infrastructure, including roadways, buildings, parks, trees, treatment plants, pumping stations, water distribution systems, drainage, and wastewater collection systems, are considered part of a One Water management system.

One Water Honolulu recognizes that O'ahu's climate future poses unprecedented challenges and requires increased collaboration, coordination, and sharing of resources. Climate change impacts require adaptation across communities, the City, the state, and federal entities. Collaboration within the City and with key partners will enable better engagement and alignment with external stakeholders, including the state, federal government, and the private sector.

The One Water Panel is comprised of, but not limited to, the following City agencies: Departments of Design and Construction (DDC), Environmental Services (ENV), Facility Maintenance (DFM), Parks and Recreation (DPR), Planning and Permitting (DPP), and Transportation Services (DTS), and the Honolulu Board of Water Supply (BWS) and Office of Climate Change, Sustainability and Resiliency (CCSR).

## Institutional Collaboration

During 2022 the One Water Panel accomplished or made progress on the following foundation building elements to formalize City collaboration.

**Set a 3-year work plan for the One Water Panel** – Building from objectives, projects, and programs identified during 2021, the Panel developed a 3-year scope of work with identified benefits and champions.

**Signed a Memorandum of Understanding (MOU)** – One Water Panel agencies finalized and signed a MOU establishing collaborative objectives and shared approaches to integrating One Water benefits and climate change resilience into appropriate City projects and programs.

**Identified Capital Improvement Program (CIP) connections** – The Panel identified projects within their respective agencies that have or could potentially add One Water benefits. This first iteration helped identify the touch points where the Panel could plug into the CIP process. In the long-term, the goal is to integrate and connect One Water project benefits and elements into CIP planning and budgeting.

**Explored funding opportunities and established cost-share agreements** – The Panel discussed and brainstormed ideas for applying for ARPA State and Local Fiscal Recovery Funds and other federal funding opportunities. Panel agencies also established cost-share agreements to fund the continued facilitation of the One Water Panel, e.g., CCSR contributed funds to BWS.

**Explored and identified needs for a "checklist"** – Learning from the City's Complete Streets program, the Panel brainstormed a potential "checklist" to fulfill the requirements of ROH §2-10.13(b)(2)(D). The Panel identified needs to incorporate a helpful "checklist" resource into established City processes for identified opportunities to integrate One Water benefits and climate resilience into City projects.

**US Water Prize** – The City was awarded the U.S. Water Alliance's 2022 Outstanding Public Sector Organization Water Prize for its work on the climate change adaptation one water policy development of panel organization. Certain Panel members attended the U.S. Water Alliance Summit in October.

**Created outreach material** – Finalized a 2-page public information resource.

**Provided a monthly forum for project and program updates** – Agencies covered highlights of ongoing projects and programs that helped foster CIP strategies.

**Formed and launched working groups** – The Panel identified objectives and began convening the Project and Planning working groups, respectively.

# Updates on One Water Climate Resilience Efforts

2022 was the second year of One Water Honolulu, which marked both foundation building for the Panel and its objectives, and coordinated work scoping.

## Coordinating for water management innovation and freshwater conservation

### Maximizing multiple forms of water

To meet every day water demand for the island of O'ahu, millions of gallons of water, wastewater, and—when it is raining—stormwater are transported, treated, or managed by the BWS, ENV, and/or DFM. Together, these departments are finding opportunities to capture, reuse, and minimize waste of water resources.

- Among the projects, BWS is in the final design phase of an expansion of the Honouliuli Recycled Water System at the Honouliuli Waste Water Treatment Plant (see Project Highlight).
- DFM is exploring potential stormwater capture at Wa'ahila Ridge in partnership with the University of Hawai'i.
- BWS and DFM are also exploring projects to capture stormwater to increase groundwater recharge and reduce local runoff during rainfall events.

**Project Highlight - Honouliuli recycled water expansion**

*Collaborating to Expand Recycled Water Availability and Conserve Groundwater Resources*

Recycled water is wastewater that has been treated to a level suitable for industrial processing, irrigation, and other non-drinking uses. Common uses include cooling towers, irrigation for golf courses, landscaping, and ornamental ponds. Recycled water is safe for human contact, but it is not intended for drinking. It is available year-round, even in times of drought, and it costs less than other new water sources. Recycled water use is closely monitored by the Hawai'i State Department of Health (DOH) to ensure it meets all health and safety standards.

BWS is in the final design phase of an expansion of the Honouliuli Recycled Water System at the Honouliuli Wastewater Treatment Plant (WWTP) in 'Ewa. Scheduled to go online by 2025, the expansion of the system will provide recycled water to Kapolei, East Kapolei, and Ho'opili. When operational, the capacity of the system to treat secondary effluent will more than double, allowing a significant increase in recycled water availability and reduction in the demand on groundwater supply. Providing recycled water to large, landscaped areas in 'Ewa, such as parks, and other businesses in Kapolei would save on their water bill once a gravity line is installed. Among other agencies, BWS is collaborating with the ENV.

### Conserving freshwater use in parks

DPR partnered with BWS and other city agencies to reduce water demand in parks. Currently, irrigation takes up the largest share of freshwater demand in the City's parks and is a large expenditure for DPR. Freshwater demand can be reduced either by cutting back on total water usage or finding alternate sources of water. As part of an energy savings performance contract DPR is investing in irrigation upgrades and efficiencies.

### Finding innovative water management opportunities with multi-benefits

There are many local-scale solutions that can be implemented to create water and community benefits. Rain catchment systems are easy and effective tools for households to conserve water outdoors. The captured rainwater can be used for several activities, including watering lawns and plants. BWS currently offers a rebate for the purchase of a rain barrel. With the potential establishment of a City Stormwater Utility, rain barrels are among the easy overlapping priorities with BWS and DFM to provide community water benefits.

## Coordinating for infrastructure and service improvements

### Protecting O'ahu's watersheds and installing green infrastructure

From mauka to makai, City agencies are working to protect O'ahu's watersheds and retrofit existing places with green infrastructure. Albizia trees in the upper watersheds are one of the most invasive species in Hawai'i, and take over native forest areas.

- BWS is partnering with the Albizia Project to remove albizia trees and restore native forests. Removing albizia is no easy task. These trees can grow as big as 30 to 48 inches in diameter and 60 to 120 feet tall! The Albizia Project works with the City and state in their native forest restoration efforts and turns the lumber into useful material.
- BWS is working to establish the Hālau Wai Mānoa, which is a continuation of agricultural use at its property in upper Mānoa Valley, with a focus on promoting watershed protection, water conservation, native forest restoration, invasive species removal, lo'i restoration, and sustainable agriculture. The project will provide place-based, hands-on educational opportunities to learn about watersheds, forest health, watershed protection, water conservation, and sustainable resource management practices.
- DFM is a City Complete Streets Core Team member and is working to incorporate green stormwater infrastructure (GSI) and innovative water management practices into City projects, e.g., University Avenue re-design. GSI such as bioretention or permeable pavers can reduce and slow stormwater flows to the drainage system and help provide water for landscaped areas and trees.

### Developing a Stormwater Master Plan

The City is seeking to improve the responsiveness and quality of island-wide storm water management services through the development of a comprehensive Stormwater Master Plan. This Plan will guide and inform City programs and investments over the next 50+ years. This Plan will guide City resource allocations to achieve long-term stormwater management goals and objectives. It will also provide a framework for increased transparency. As part of the Master Plan, specific projects will address local drainage and green stormwater infrastructure, workforce development, asset renewal and replacement, regional flooding and watershed management, and partnership opportunities and will look to integrate climate change and sustainability initiatives. The

Stormwater Master Plan is intended to provide a framework for management of O'ahu's system of streams, ditches, and other stormwater management facilities and will be a helpful resource for climate change adaptation.

**Program Highlight – Exploring the Development of a Stormwater Utility**
*Investments for O'ahu's future*

Storm water utilities play an important role for thousands of cities around the U.S. in managing storm water runoff and its impacts on communities and the environment. DFM evaluated the feasibility of forming a stormwater utility for O'ahu with technical analyses and guided by a Stakeholder Advisory Group and two rounds of islandwide community engagement. While the City currently complies with state and federal stormwater standards, O'ahu's complex storm water system needs significant new investment to meet current and future stormwater challenges. If established, Stormwater Utility funding could be used for infrastructure repair and replacement, stream cleaning, and nearshore water quality improvement, in addition to continued maintenance and compliance. With a Stormwater Utility, the City would be partnering directly with community members to manage stormwater runoff from properties.

## Coordinating for climate resilience planning

### Integrated water management across agencies

The US Environmental Protection Agency (EPA) defines integrated planning as a process that identifies efficiencies from separate wastewater and stormwater programs to best prioritize capital investments and achieve our human health and water quality objectives. This approach can also lead to more sustainable and comprehensive solutions, such as green infrastructure, that both improves water quality and provides multiple benefits that enhance community vitality. ENV initiated a feasibility study, and along with DFM are exploring ways to implement an integrated water quality planning approach according to EPA guidelines to leverage potential funding sources for programmatic enhancements and/or One Water climate resilience projects.

### Aligning climate resilience planning and strategies

One of the critical objectives for One Water Honolulu is coordination of decisions and investments for critical City infrastructure and services in sea level rise-impacted areas. The Panel began investigating adaptation scenarios for the Māpunapuna area. Once fishponds, the area is now a low-lying industrial area built on fill. There is land subsidence and sea level is rising. The area is well known for periodic flooding from either rainfall or storm drain backflow during high tides. Commercial and industrial properties in the area have dealt with nuisance flooding over many decades, and BWS has experienced more than 50 water main breaks in this area over the past 30 years, primarily due to corrosion and settlement. The nuisance flooding, which also impacts other buried utilities and infrastructure, roads, emergency vehicle access, and property usage, will continue to worsen with sea level rise. Such collaborative efforts are the beginning of aligning long-term planning efforts with future infrastructure and service needs in the face of climate change.

# Appendix: One Water Panel Agencies

### Office of Climate Change, Sustainability and Resiliency (CCSR)

CCSR is tasked with tracking climate change science and potential impacts on City facilities, coordinating actions and policies of departments within the City to increase community preparedness, developing resilient infrastructure in response to the effects from climate change, and integrating sustainable and environmental values into City plans, programs, and policies. CCSR facilitates the inter-agency One Water Panel.

### Board of Water Supply (BWS)

BWS serves approximately 145 million gallons per day (mgd) of potable water and 10 mgd of non-potable water to customers on O'ahu. The municipal potable water system provides dependable service through a complex system of 2,100 miles of pipe, 386 source and booster pumps, 212 water sources (wells, tunnels, and shafts), and 171 water storage reservoirs. BWS provides non-potable water for irrigation and industrial uses through a water recycling facility and several separate brackish sources. Groundwater is the only source for the BWS potable water supply, coming from naturally filtered aquifers, and thus a key mission of the department is to ensure a clean, robust groundwater supply into the future. BWS is a major leader in resilience and innovative practices in water management, and participates in the Hawai'i Community Foundation's Fresh Water Initiative advancing water conservation, recharge, and reuse.

### Department of Design and Construction (DDC)

The DDC Civil Division plans, designs, and constructs projects related to public infrastructure and other public works structures. DDC is responsible for much of the City's project planning, engineering studies, alternative analysis, preparation of environmental documents, processing of permit applications, preparation of plans, specifications, and estimates for construction, and administration of consultant and construction contracts.

### Department of Environmental Services (ENV)

In addition to managing solid waste, ENV collects approximately 103 million gallons per day (mgd) of wastewater from the toilets, sinks and drains from homes and workplaces on O'ahu. Through a system of 2,100 miles of pipeline, with gravity flow and 72 pump stations, the wastewater is delivered to nine wastewater treatment plants, which are spread over the island and either owned or operated by the City. After the wastewater is processed, the remainder is called effluent. ENV keeps close tabs on effluent through monitoring, discharging it back into the environment at deep ocean outfalls, reservoir, or underground injection wells. In some cases, it is recycled and reused for irrigation and industrial purposes. ENV wastewater divisions of Collection System Maintenance, Treatment & Disposal and Environmental Quality protect public health and the environment through responsible management of wastewater.

## Department of Facility Maintenance (DFM)

DFM administers maintenance programs for City facilities, including streams and flood control systems. DFM's Storm Water Quality Division (SWQ) works to safeguard the quality of the water that enters the City's drainage system, which directly impacts the health of O'ahu's natural waterways and nearshore environments. SWQ's mission is to empower and provide guidance on minimizing our impact on water quality in order to protect public health and the environment. SWQ works with City departments as well as businesses, agencies, and individuals to foster shared responsibility for protection of our water. In 2021, DFM's SWQ branch received national recognition by the Water Environment Federation (WEF) Stormwater Institute for its leadership in stormwater management. The City's Municipal Separate Storm Sewer System (MS4) Phase 1 Program was awarded Gold for Program Management and Silver for Innovation.

## Department of Parks and Recreation (DPR)

DPR is responsible for City parks, gardens, and street and park trees islandwide. From playgrounds to camp grounds, beach parks to botanical gardens, the department manages 402 designated park facilities on 4,967 acres, while also overseeing approximately 1,820 acres of undeveloped lands around O'ahu, as well as more than 200,000 park and street trees. Water is critical to the operations and the amenities of O'ahu's parks. Irrigation is essential to maintain fields, trees, and landscaped areas of DPR facilities. Healthy natural water bodies and coastal waters are also key to community enjoyment and recreation in parks.

## Department of Planning and Permitting (DPP)

DPP is responsible for the City's long-range and community planning efforts and for the administration and enforcement of various permits required for the development and use of land. It is also responsible for the administration and enforcement of various codes pertaining to the construction of buildings and for the administration and enforcement of various city standards and regulations pertaining to infrastructure requirements. DPP works with other One Water leaders to ensure alignment between long-range planning efforts and infrastructure planning.

## Department of Transportation Services (DTS)

Water may not be the first concept that comes to mind when thinking about the DTS. However, DTS's extensive multi-modal transportation system both has influence on and is impacted by water. Together with the other One Water leaders, DTS is working to incorporate best practices in design for community access and climate change adaptation, such as green and complete streets, and planning to ensure an accessible roadway network.