Wai Maoli

HAWAIʻI FRESH WATER INITIATIVE

A Blueprint for Action

Summary

HAWAIʻI COMMUNITY FOUNDATION

Crisis on the Horizon?

Fresh water is our single most important natural resource in Hawai'i, but our supply is increasingly threatened. Hawai'i is hotter, drier, and more crowded than ever.

Rainfall has decreased 22% in Hawai'i over the last 30 years … and key groundwater levels have declined.

Over half of Hawai'i's original watershed forests have been destroyed … and only 13% of remaining forested acres are actively protected.

Hawai'i's population has doubled since statehood and is expected to double again in the next 60 years … not including the more than 200,000 tourists we host each day.

Our water infrastructure is increasingly fragile … municipal pipes are aging, reservoirs are being abandoned, and many agricultural water systems are in disrepair.

Our trade wind days have declined by 28% … in 1973 Hawai'i recorded 291 "trade wind days," but by 2009 the number had dropped to only 210.

Increased runoff and less aquifer recharge occur as we convert open and agricultural land to development.

Rising temperatures mean more evaporation from soil and surface water.

More frequent and intensive drought from climate change threatens farmers, ranchers, and our economy.

These realities and projections of a **drier, hotter future** have serious consequences for the long-term availability of fresh water — and therefore the economic security — of our island home.

The time to act *is now.*

A Plan for Our Water

Fresh water is the foundation of economic and environmental sustainability for Hawai'i in the 21st century. The Hawai'i Community Foundation convened a diverse blue-ribbon Fresh Water Council made up of experts from across the state — farmers, landowners, scientists, conservationists, and government officials. The council unanimously agreed that to achieve water security, Hawai'i needs to:

Create 100 million gallons a day of additional, reliable fresh water supply by 2030.

To achieve this, the Council identified three aggressive targets that must be met by 2030:

CONSERVE » Improve efficiency in how water is transported and used so that ***each Hawai'i resident requires 15% less water per capita*** to meet our needs.

RECHARGE » ***Capture more rainwater in our aquifers*** by expanding and actively protecting watershed areas while improving our storm water retention.

REUSE » ***Double the amount of wastewater being treated and reused*** to irrigate parks and local crops across our Hawaiian Islands.

The Fresh Water Blueprint for Action lays a foundation for a sustainable water future for our state. It offers Hawai'i's decision makers a new vision and clear recommendations for policy changes that have broad, multi-party support. The Blueprint lays out a strong, proactive agenda to protect Hawai'i's fresh water future and avoid costly problems down the road.

California offers a cautionary tale: the recent drought in that state resulted in 25% mandatory water use cuts and over $50 billion in economic damage.

CONSERVE

RECHARGE

REUSE

To achieve the goal of "no net loss" for Hawai'i's underground water resources, the Fresh Water Council identified three key strategies to provide the additional water capacity that Hawai'i needs by 2030.

CONSERVE

40+ million gallons per day by 2030

RECHARGE

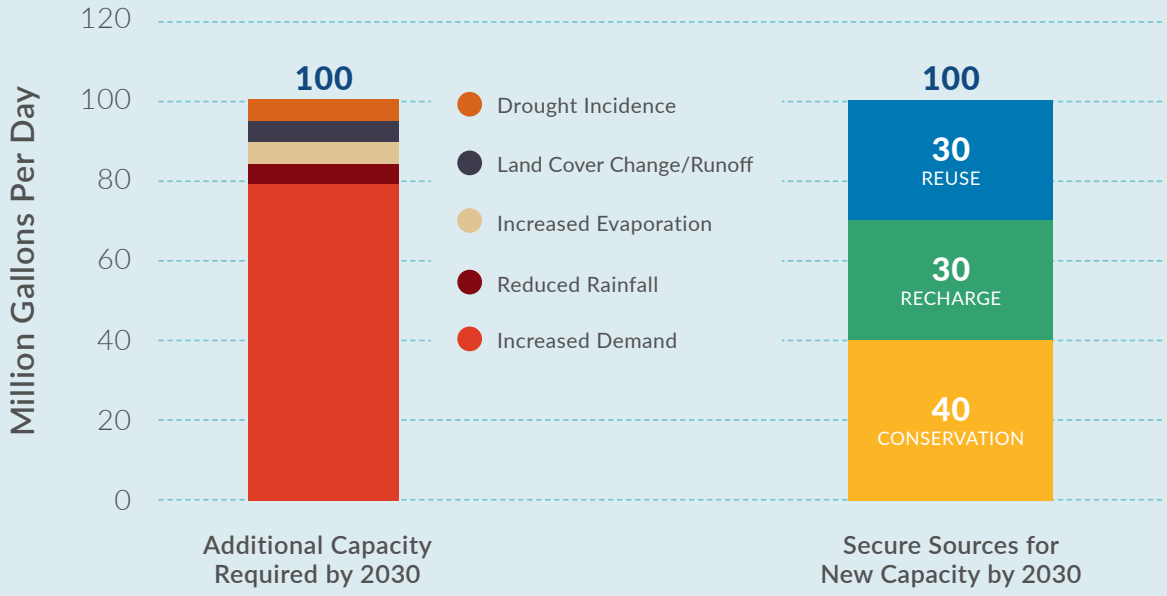
30+ million gallons per day by 2030

REUSE

30+ million gallons per day by 2030

2030 Additional Capacity

No Net Loss Goal and Strategies



Hawai‘i’s 2030 Fresh Water Solutions

CONSERVE » 40+ MILLION GALLONS PER DAY BY 2030

Goal

Improve the efficiency of our daily groundwater use rate by 15%, saving 25 gallons a day per resident by 2030.

Strategies

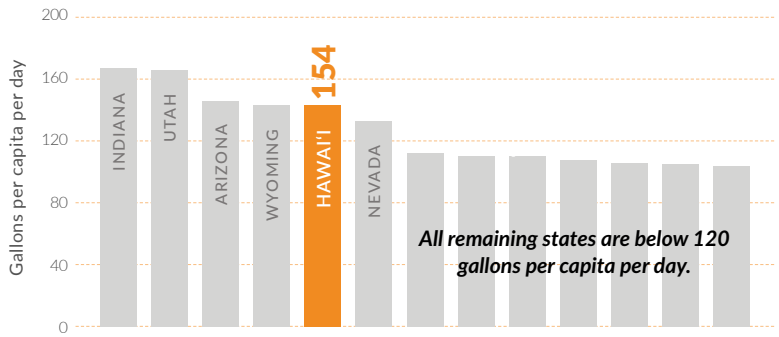
- **Reduce potable water use on landscape areas** by providing incentives to private homeowners for rainwater catchment systems, boosting installation of alternative irrigation or native plants in new developments, and encouraging conservation.
- **Encourage leak detection systems** by requiring water system operators to audit their current water system losses and create plans to achieve benchmark leakage rates.
- **Improve agricultural water efficiency** by upgrading ditch systems, lining reservoirs, and increasing water-saving techniques used by farmers that will result in 10 million gallons per day of savings.
- **Encourage water conservation behavior** through education and new technology.

15%

decline in per capita water use by 2030

Residential Per Capita Water Use by State

Source: Water Use Trends in United States, Pacific Institute, April 2015



RECHARGE » 30+ MILLION GALLONS PER DAY BY 2030

Goal

Increase Hawai'i's ability to absorb rainwater via storm water capture and expanded protection of watershed areas.

Strategies

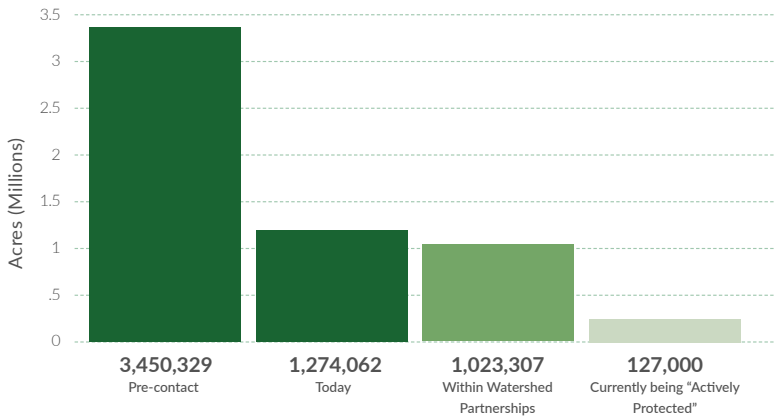
- **Strengthen watershed partnerships** while increasing Hawai'i's protected forest areas from an estimated 127,000 acres to 211,000 by 2030.
- **Increase storm water capture** by establishing storm water utilities and supporting investment at the county level.
- **Support and preserve reservoir systems** and their viability throughout Hawai'i.
- **Enhance and increase large recharge areas** by supporting policies and/or incentives to increase retention basins and wetland areas, while implementing best practices in low-impact development.

Actively protect

25%

of Hawai'i's watershed forest by 2030

Forested Area in Hawai'i



REUSE » 30+ MILLION GALLONS PER DAY BY 2030

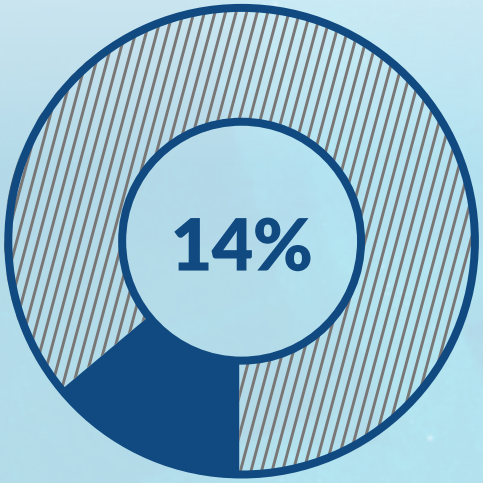
Goal

More than double the amount of wastewater being reused in the Islands to 50 million gallons per day.

Strategies

- **Revise water reuse guidelines** to lower barriers to reuse in residential, industrial, and agricultural applications.
- **Revise greywater guidelines** to allow for expanded greywater usage in newly constructed projects while encouraging adoption and implementation of an updated Uniform Plumbing Code.
- **Increase water reuse** for large landscaped areas such as golf courses, parks, roadways, landscaping, and industrial operations.
- **Decentralized water treatment and reuse infrastructure** to ensure resilience and decrease power costs.

Percent of Wastewater Reused in Hawai'i, 2013



Increase water reuse

125%

by 2030

Implementation

To successfully provide 100 million gallons per day in additional, reliable water supply by 2030, ***increased funding, collaboration, data, and transparency is required across Hawai'i.***

Recommendations:

- ***Create comprehensive data sources.*** Establish a reliable water security monitoring network; support a dedicated entity to be a water-data clearinghouse for multiple stakeholders; and ensure the Hawai'i State Sustainability Dashboard includes key metrics on water.
- ***Kickstart innovation and new water approaches through a Natural Capital Investment Partnership.*** Funding from state and private sources will catalyze pioneering work via conservation, recharge, and reuse projects that can be piloted and then replicated at scale throughout the state.
- ***Develop an educational campaign*** to increase consumer awareness of the origins, importance, and need to conserve fresh water.
- ***Decentralize our water treatment and reuse infrastructure*** via the strategic and thoughtful use of small-scale water recycling plants.
- ***Ensure long-term dedicated funding at the state-level*** for expanded watershed area maintenance and protection through 2030.

Fresh Water Council

The Hawai‘i Community Foundation created the Wai Maoli: Hawai‘i Fresh Water Initiative in 2013 and invited knowledgeable stakeholders from multiple sides of the issue to convene as a blue-ribbon Fresh Water Council.

The Council’s mission was to collaboratively identify shared solutions that would benefit citizens throughout the state. Members, participating as individual experts and not as formal representatives of any agency or organization, worked for over a year to research the issue and reach consensus around specific policy changes that must be adopted to improve our long-term fresh water supply.

Members of the Council recognize the critical importance of water security and, unlike many blue-ribbon panels, have agreed to continue working together to help implement the recommendations contained in this document and the Fresh Water Blueprint for Action.

WILLIAM AILA Born and raised on O‘ahu, William serves as deputy director of the Department of Hawaiian Homelands. Prior to being appointed to the position in 2015 by Governor Ige, William served as the director of the Department of Land and Natural Resources. William formerly was the Wai‘anae Boat harbormaster and an active community organizer.

REGINALD CASTANARES Reggie became the Business Manager and Financial Secretary of the Plumbers and Fitters Local 675 in 2007. He promotes the welfare and stability of the plumbing and pipefiting industry in Hawai‘i and throughout the Pacific.

STEPHEN ANTHONY* Steve is director of the USGS Pacific Islands Water Science Center, whose mission is to provide reliable, impartial, and timely information to help manage, protect, and enhance water resources in Hawai‘i and the Pacific. The USGS is a science organization that provides information on a range of natural resources.

MEREDITH CHING Meredith is senior vice president at Alexander & Baldwin, Inc. She serves on a number of professional and nonprofit boards including the Land Use Research Foundation and Hawai‘i Agricultural Foundation. Previously, she served on the State of Hawai‘i Commission on Water Resource Management and the State Board of Agriculture.

MICHAEL BUCK Mike is the former Administrator of the Hawai‘i Division of Forestry and Wildlife, and currently sits as a Commissioner on the Hawai‘i State Commission on Water Resources Management. He played a leadership role in establishing Hawai‘i’s regional watershed partnerships with public and private landowners.

DEREK CHOW Derek is the chief of the Civil and Public Works Branch of the U.S. Army Corps of Engineers (USACE), Honolulu District. He is responsible for overseeing USACE water resources development activities. USACE services include ecosystem restoration projects, watershed planning, and water resources technical studies.

SUZANNE CASE Suzanne serves as Chair of the Hawai‘i Board of Land and Natural Resources, and Director of the Department of Land and Natural Resources (DLNR). Prior to her appointment to DLNR in 2015 by Governor Ige, she served 28 years at The Nature Conservancy, half as Regional Counsel and half as Hawai‘i Executive Director.

KA‘EO DUARTE Ka‘eo is water resources manager for Kamehameha Schools. His research interests include hydrology, water management, coastal processes, ecohydrology, and indigenous knowledge systems. He holds a Ph.D. in environmental engineering, specializing in hydrology, from the Massachusetts Institute of Technology.

*** US Geological Survey Liaison/Scientific Advisor to HCF**

SUMNER ERDMAN Sumner runs the 18,000-acre ʻUlupalakua Ranch, which his family purchased in 1963. A conservation-minded rancher, he has worked in partnership with nonprofits and government agencies to protect natural resources that have also protected the ranch's bottom line via water and mineral cycles.

MARK FOX Raised on Hawai'i island, Mark is Director of External Affairs at The Nature Conservancy's Hawai'i Program where his work includes public policy and advocacy related to natural resources. Mark formerly served on the Washington staff of U.S. Senator Daniel K. Inouye, handling environment and agriculture issues, and before that practiced law at Carlsmith Ball LLP in Honolulu.

THOMAS GIAMBELLUCA Tom serves as a professor in the Geography Department at the University of Hawai'i at Mānoa, and focuses his work on conducting field and modeling projects on climate and natural vegetation, restoration of degraded lands, and water resource management under changing land uses and the impacts of climate change.

TIMOTHY JOHNS, Chair Tim is chief consumer officer at HMSA and serves on numerous boards and commissions, as well as trustee for the Parker Ranch Foundation Trust. Tim formerly served as the chair of the Hawai'i State Department of Land and Natural Resources and as chief operating officer of the Estate of Samuel Mills Damon.

HOWARD KILLIAN As the commander at U.S. Army Garrison-Hawai'i from 2004 to 2007 and subsequently deputy director, Installation Management Command, Pacific Region, Howard built strong relationships with the conservation community and has since focused on environment and sustainability issues for the Department of Defense in Hawai'i.

PATRICK KOBAYASHI Patrick is the president & CEO of Kobayashi Group, LLC and previously worked for the National Association of Home Builders in Washington, D.C. He was appointed to serve in the Oʻahu seat for the board of the Agribusiness Development Corp by Governor Abercrombie in 2012.

ERNEST LAU As manager and chief engineer at the Honolulu Board of Water Supply since 2012, Ernie is responsible for its overall strategic direction and management. Ernie previously worked as deputy director of the State Commission on Water Resource Management and as the manager and chief engineer of the Kauaʻi Department of Water.

KEITH OKAMOTO Keith began with the Department of Water Supply on Hawai'i Island in 1996 as a licensed civil engineer in the Water Resources and Planning Branch of the Engineering Division. Throughout the years, he has worked in various positions and branches. Since July 2015, Keith has served as the Manager-Chief Engineer of the Department of Water Supply.

JERRY ORNELLAS Raised on a dairy on Kauaʻi, Jerry started farming at 16 years old and now works with orchard crops. He is a graduate of the Agricultural Leadership Foundation of Hawaiʻi. He works for the University of Hawaiʻi, College of Tropical Agriculture and Human Resources as an agricultural research technician and is a member of the East Kauaʻi Water Users Cooperative.

MONTY RICHARDS Monty is a fifth generation resident of Hawai'i and chairs the board of Kahua Ranch after serving for many years as its president. During that time, he innovated solutions for raising livestock and growing crops. Monty is currently engaged in the community and serves on the board of The Nature Conservancy and other organizations.

KAPUA SPROAT Kapua was born and raised on Kauaʻi's North Shore, and received her Juris Doctor from the University of Hawaiʻi at Mānoa (UH). After serving as counsel for Earthjustice's Mid-Pacific Office and working on several high-profile water cases, Kapua returned to UH as a professor with the Center for Excellence in Native Hawaiian Law and director of the Environmental Law Clinic.

DAVID TAYLOR Dave has served as the director of Maui's Department of Water Supply since 2010. Dave has a master's degree in civil engineering from the University of California, Berkeley and previously served as the chief of the Wastewater Division for the County of Maui.

DENNIS TERANISHI Dennis was raised on a vegetable farm on Oʻahu's North Shore. He started at Amfac in 1971 as associate agriculturist and rose to vice president of diversified agriculture and planning. Now, he is president/CEO of Pacific International Center for High Technology Research, a nonprofit focused on technology for various industries, including agriculture.

BARRY USAGAWA Barry heads the Water Resources Division of the Honolulu Board of Water Supply, which consists of Water Systems Planning, Water Conservation, Long Range Planning, and the Hydrology-Geology Sections. Water Resources conducts long-range water resource and capital planning for Oʻahu to ensure adequate water supplies and dependable water systems.

CONSERVE | RECHARGE | REUSE

Water Security for Hawai‘i

A plan to create 100 million gallons
a day of additional, reliable fresh water by 2030.

WAI MAOLI: HAWAI‘I FRESH WATER INITIATIVE AND THE FRESH WATER BLUEPRINT FOR ACTION ARE SUPPORTED BY:

Agne Family Fund
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Frost Family Foundation
Harold K.L. Castle Foundation
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Marisla Foundation
Sidney E. Frank Foundation
The Koaniani Fund
The Kresge Foundation
Ulupono Initiative
Weissman Family Foundation

“Wai Maoli” refers to the “authentic and real waters” of Hawai‘i. The name of this broad initiative to protect our fresh water supply was developed with the assistance of Keli‘i Wilson, manaleo from the Island of Hawai‘i and a long-time advocate for environmental and cultural perpetuation throughout our Islands.

HAWAI‘I COMMUNITY FOUNDATION
Amplify the Power of Giving

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