



State of Hawaii Commission on Water Resource Management

Program Briefing Kauaʻi



April 28, 2015

Islands in the Pacific Ocean



Commission on Water Resource Management

- Seven (7) Members of the Commission
 - Chairperson of BLNR (Chair of Water Commission)
 - Suzanne Case
 - Director, State DOH (ex-officio voting member)
 - Virginia Pressler, M.D.
 - Five members are appointed by the Governor & confirmed by the State Senate



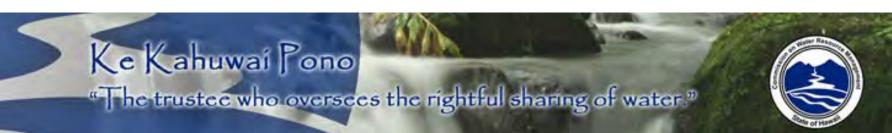


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Milton Pavao

Jonathan Starr















Commission on Water Resource Management

Water Quantity





Water Quality









"The trustee who oversees the rightful sharing of water."



Water Management in Hawai'i



Hawai'i State Constitution, Article XI, Section 1 (emphasis added)

"For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources, including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State"

"all public natural resources are held in trust by the State for the benefit of its people."



Water Management in Hawai'i



Hawai'i State Constitution, Article XI, Section 7

(emphasis added)

"The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people."

"The legislature shall provide for a **water resource agency** which... shall set overall water conservation, quality and use policies; define reasonable and beneficial uses; protect ground and surface water resources, watersheds and natural stream environments; establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses and establish procedures for regulating all uses of Hawaii's water resources."



The trustee who oversees the rightful sharing of water."

The State Water Code (1987)

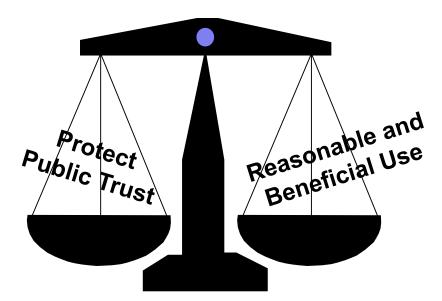


The Code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, agricultural uses, power development, and commercial and industrial uses. (§174C-2(c) HRS)

Adequate provision shall be made for the protection of traditional and customary Hawaiian rights, the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the State for municipal uses, public recreation, public water supply, agriculture, and navigation. (§174C-2(c) HRS)



Protect the Public Trust and Ensure uses are Reasonable and Beneficial





Protection of Public Trust

- 4 Public Trust Purposes
 - Maintenance of Water in its Natural State
 - Domestic use (individuals)
 - Traditional and Customary Rights
 - DHHL Reservations





Ensure uses are Reasonable and Beneficial

- Purpose
- Justified Quantity
- Efficient



- Lack of practicable alternatives
- Consistent with the public interest
- Consistent with state and county land use plans





Public Trust Doctrine

"...all public natural resources are held in trust by the State for the benefit of its people."

"The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people."



Commission on Water Resource Management

Precautionary Principle

There is a duty to take anticipatory action to protect public trust resources and uses from harm.



Ke Kahuwai Pono "The trustee who oversees the rightful sharing of water."

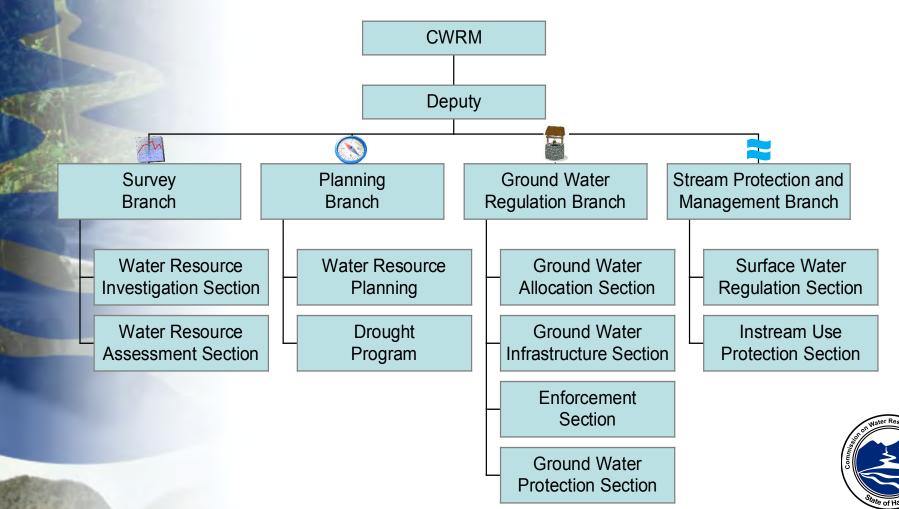






Commission Staff

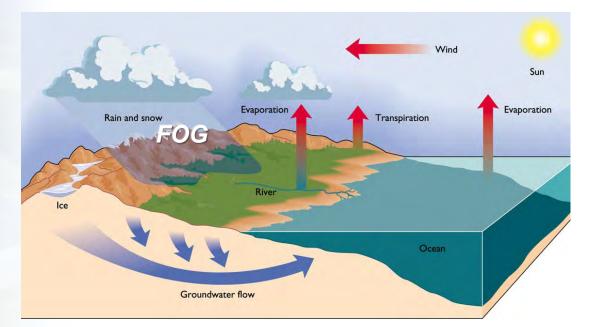
Current Position Count: 23



How much water is available?

Resource Assessments

- Hydrologic Unit Delineation
- Ground Water Sustainable Yields
- Surface Water Instream Flow Standards

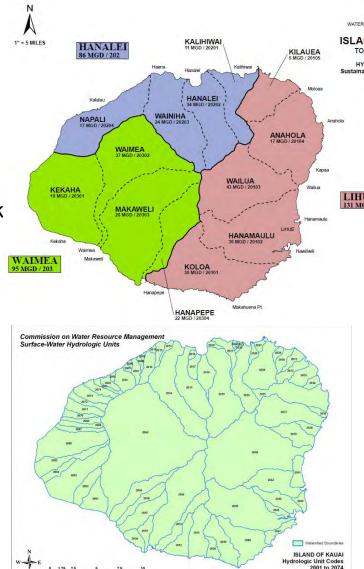




Resource Assessments – Hydrologic Unit Delineation

- Ground Water Aquifers
 - 3 Aquifer Sector Areas (broad hydrogeologic similarities)
 - 13 Aquifer System Areas (hydraulic continuity)
 - Aquifer settings: basal, perched, caprock brackish, deep (below salt water)

- Surface Water Hydrologic Units
 - 74 SWHUs
 - Surface water settings: streams, springs, ditches/canals, reservoirs



Ground Water

Resource Assessments – Groundwater Sustainable Yields

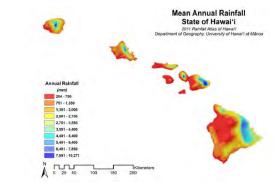
R = RF - DRO - ET

Simplified recharge calculation where:

R = Recharge RF = Rainfall & Fog drip DRO = Direct runoff ET = Evapotranspiration



Rainfall Atlas updated in 2012

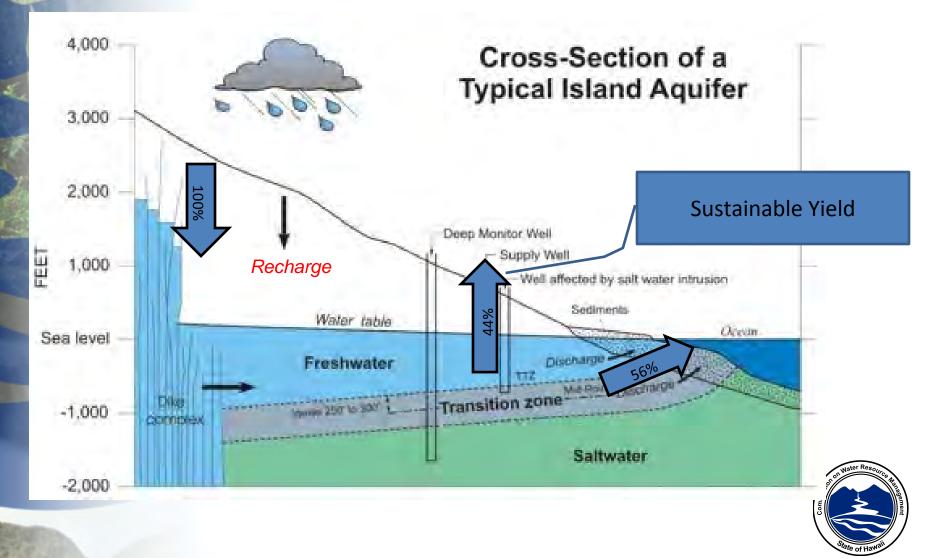


ET Analysis complete in June 2013



Ground Water

Resource Assessments – Groundwater Sustainable Yields

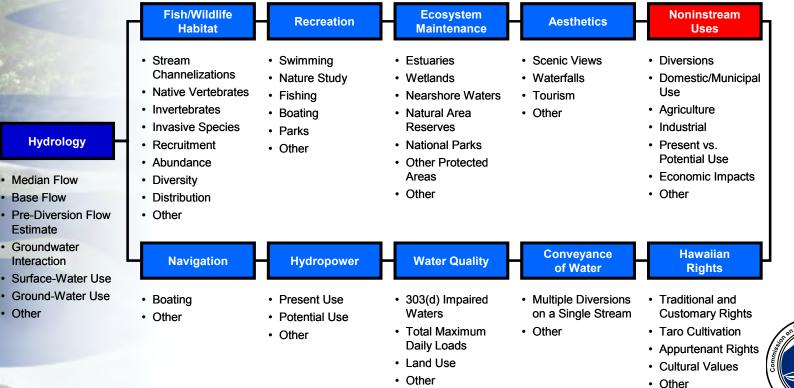


Surface Water

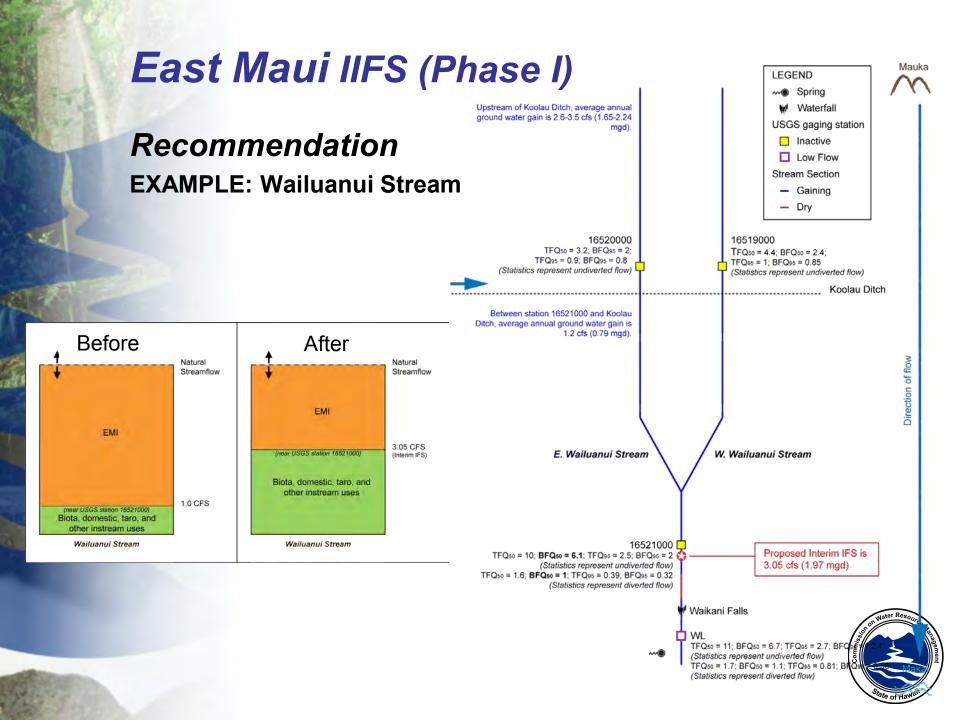
Other

Resource Assessments – Instream Flow Standards

"A quantity or flow of water or depth of water which is required to be present at a specific location in a stream system at certain specified times of the year to protect fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses."





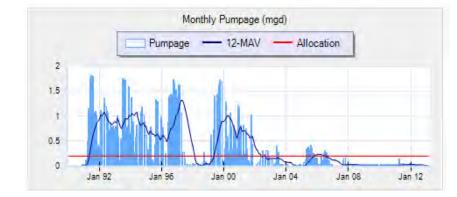


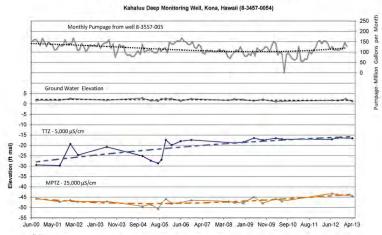
How much water do we use?

Resource Monitoring

- Water Use Reporting
- Deep Monitor Wells
- Water-Level Observation Well
- Climate

- Chlorides
- Streamflow





Trends in Pumpage and Water levels and Transition Zone Elevations

Notes: (1)Top of transition zone (TTZ) = 5,000µSicm; Mid point transition zone (MPTZ) = 25,000 µSicm; (2) Water levels and transition zone elevations are relative to mean sea level (msi) (3) Trandlines are dashed

last updated 5/31/2013



How we regulate the use of our water?

Permitting & Enforcement

- Well Construction and Pump
 Installation Permit
- Stream Diversion Works Permit
- Stream Channel Alteration
 Permit
- Water Use Permit

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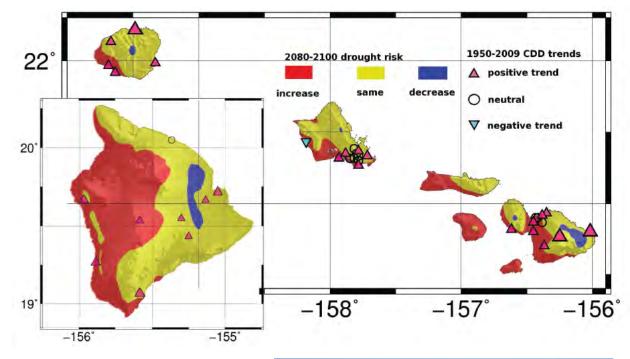


Threats, Trends, and Resource Priorities



Climate Change

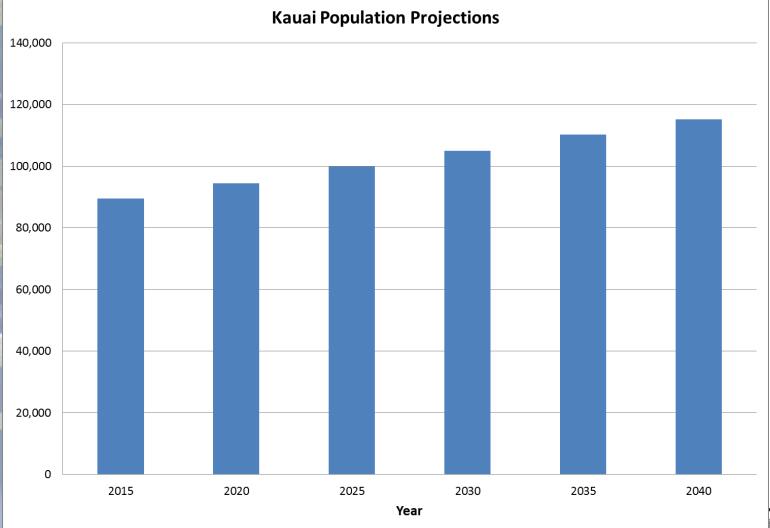




- Air temperatures are rising
- Precipitation and drought patterns are changing
- Streamflow is declining



Increasing Water Demands





Native Hawaiian Water Rights

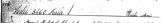


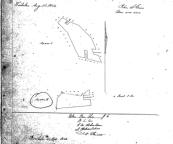
DHHL

DEPARTMENT OF HAWAIIAN HOME LANDS

Traditional & Customary

Appurtenant







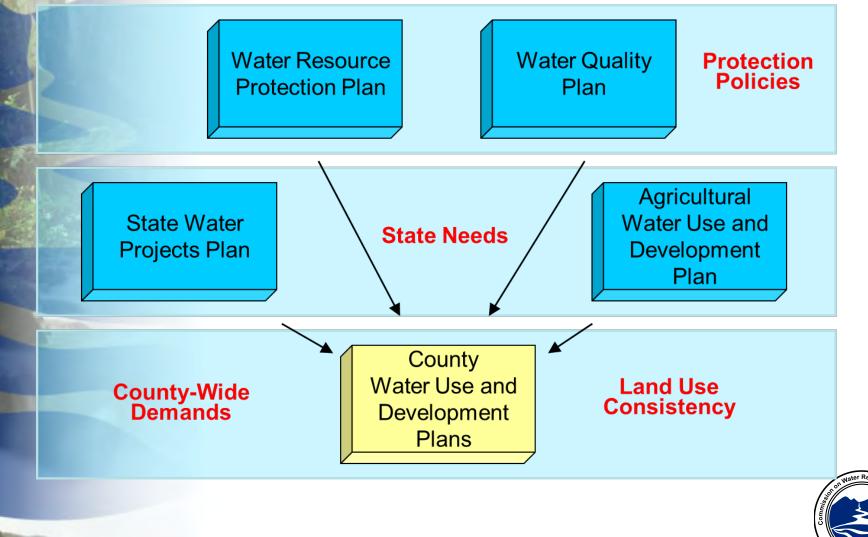


How will we meet all of our water needs?

Will we run out of water?

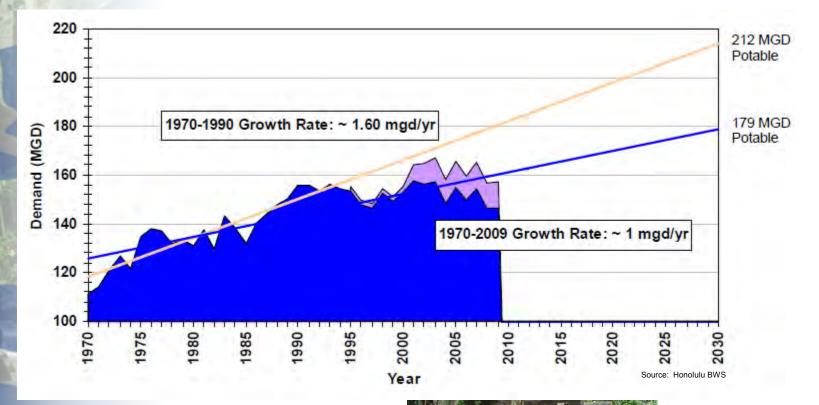


Hawaii Water Plan



Communication of the second se

Water Conservation (Oahu)





Alternative Water Sources







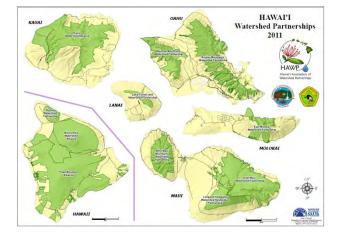


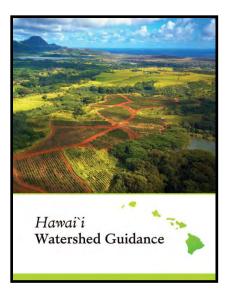


Watershed Management

CWRM Support of Watershed Management

- Climate Studies
 - Rainfall Trends
 - Evapotranspiration Analysis
- Hydrologic Studies
 - Recharge Updates
 - Numerical Ground-Water Model Development
- Baseline Data Collection
 - Rainfall
 - Streamflow
 - Ground Water Levels
 - Aquifer Trends



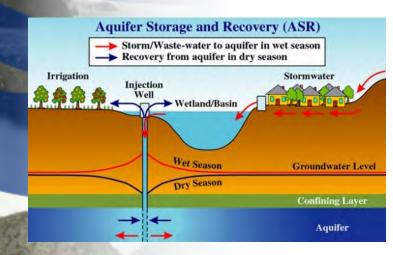




Storage

With decreasing rainfall and more extreme events, natural supplies will decrease, making storage increasingly important to meet our water needs...

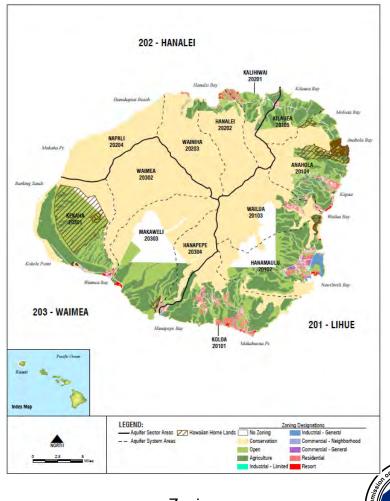






County Land Use Controls





General Plan

Zoning



Commission's Surface Water Program



Stream Protection and Management Branch

Permitting and Enforcement:

Statewide

- Stream channel alteration permits
- Stream diversion works permit
- Respond to surface water-related complaints
- Water use reporting

Water Management Areas (Maui Only)

 Identify and quantify appurtenant rights and issue water use permits for surface water management area

Stream Protection and Management Branch

Interim Instream Flow Standards (IIFS):

- Monitor IIFS for East Maui and Na Wai Eha streams
- Waimea petition to amend the IIFS and waste complaint





Establishment of Instream Flow Standards

An IFS means a quantity, flow, or depth of water needed to protect beneficial instream uses which include:

- Maintenance of aquatic habitat;
- Recreation;
- Estuaries and wetlands;
- Navigation;
- Hydropower;
- Water quality;



- Conveyance of irrigation and domestic water to downstream points of diversion; and
- Protection of traditional and customary rights.

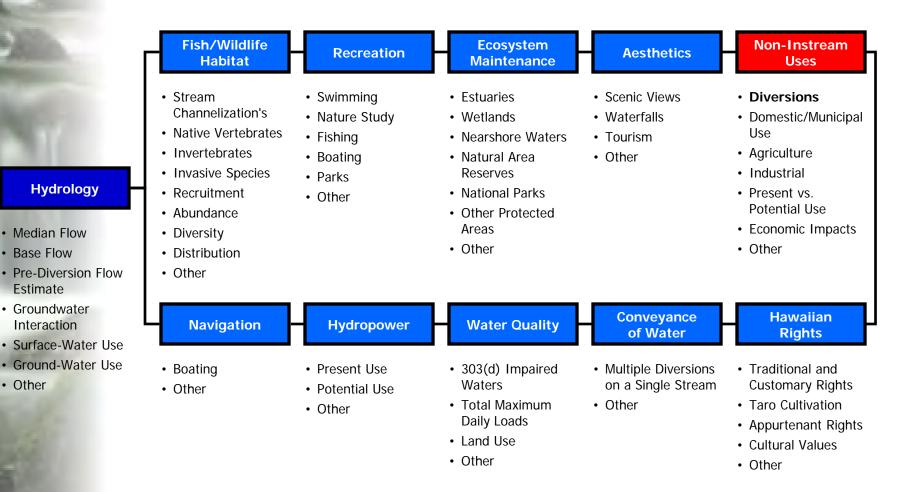
Assessment of Instream and Non-Instream Uses

Inventory and evaluate best available information. ٠

Estimate

Other

- Information will be organized and assessed by surface-water hydrologic units. •
- Employ a public input process to incorporate additional information.



Commission's Ground Water Program

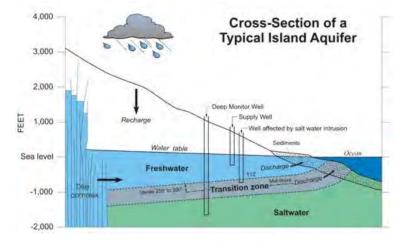


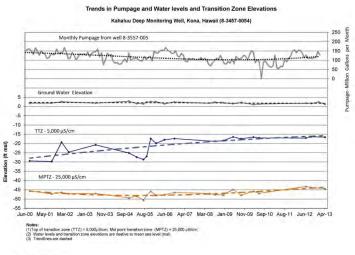
How is ground water monitored?

Hydrologic Monitoring – Deep Monitor Well Program

- DMWs penetrate the entire column of fresh water into the salt water
- CWRM currently logs **11** DMWs
 (6 on Oahu, 4 on Maui, 1 on Big Isle)
- Ideally, there should be 3 DMWs in each aquifer system area (over **300** DMWs)
- 2012 Legislature provided \$1.5M CIP to repair or construct new DMWs







last updated 5/31/2013

Water Use Reporting System

How is ground water monitored?



CWRM is pleased to announce the development of its new online Water Use Reporting System. You can login to our system, type in your monthly water data, and with a click of a button, the data is automatically entered in our database.

The Water Use Reporting System is quick and easy, saving you time and money. Allowing you to see your history of reported water use and generate graphs to visually track your water use over time.

Join CWRM in bringing water management and data collection into the 21st century. Choose to use our online Hawaii State Water Use Reporting system.



Kalanimoku Building 1151 Punchbowl Street, Room 227 Honolulu, Hawaii 96813

Hours: 7:45am to 4:30pm

Mailing Address: Commission on Water Resource Management P.O. Box 621 Honolulu, Hawaii 96809 Phone: (808) 587-0214

Fax: (808) 587-0219

E-mail: dlnr.cwrm@hawaii.gov

Website: http://dlnr.hawaii.gov/cwrm/



Commission on Water Resource Management (CWRM)

State of Hawaii, Department of Land and Natural Resources

Ke Kahuwai Pono

"the trustee who oversees the rightful sharing of water"

Water Use Reporting

Ground Water



Water meter with totalizer. (HAWAII Well Construction & Pump Installation Standards)

Phone: (808) 587-0214

Water Use Reporting System

How is ground water monitored?



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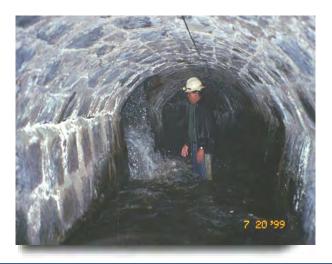
4,059 wells statewide need to report monthly pumpage, water-levels, chlorides, and temperature. 432 of those wells are on Kaua'i.



How is ground water developed?

Ground Water

- Wells
- Shafts
- Tunnels



How We Deliver Water

When you turn on your tap, you set in motion a fantastic journey. Water is pumped from the aquifer via wells, shafts and tunnels. Once up on the surface, it enters an island-wide transmission system. Within the system, water is moved from pumping stations, sometimes via booster stations, to mains and reservoirs where it is stored until needed by homes and businesses.



Booster Station Used to push water over long distances and to higher elevations. Pumping Station Pumps water from wells, shafts and tunnels into the transmission system.

Dike Tunnel Draws out groundwater trapped between dikes. Inclined Shaft Reaches down to the top of

to the top of the aquifer and skims Deep Well off its Located over upper the basalt aquifer. These wells supply the majority of O'ahu's water.

Caprock Well Pulls non-potable water for irrigation. Located in coastal plain sediments.

Artesian Well Located in the coastal plains. It will flow naturally if the ground is lower than the water table.

Source: Honolulu Board of Water Supply

How is ground water developed?

Ground Water

- Wells
- Shafts
- Tunnels





Department of Land and Natural Resources COMMISSION ON WATER RESOURCE MANAGEMENT

> HAWAII Well Construction & Pump Installation STANDARDS

> > Honolulu, Hawaii Revised February 2004

How is ground water developed?

Ground Water

- Wells
- Shafts
- Tunnels



Hawaii Well Construction & Pump Installation Standards (HWCPIS)

Optimization and Construction Issues:

Limiting well depths Pumping test procedures Elevation benchmarks Appropriate materials Grouting Monitor tubes Flow meters

Ground Water Regulation Branch

Permitting and Enforcement:

Statewide

- Well Construction permits (HWCPIS)
- Pump Installation permits (HWCPIS)
- Respond to ground water-related complaints
- Water use reporting

Water Management Areas (Oahu, Maui, Molokai Only)

 Ground water use permit allocations subject to sustainable yields

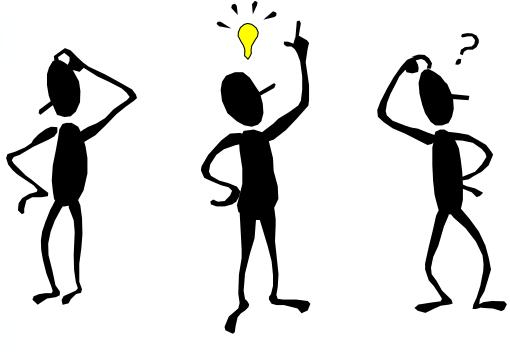






State of Hawaii

Commission on Water Resource Management





April 28, 2015