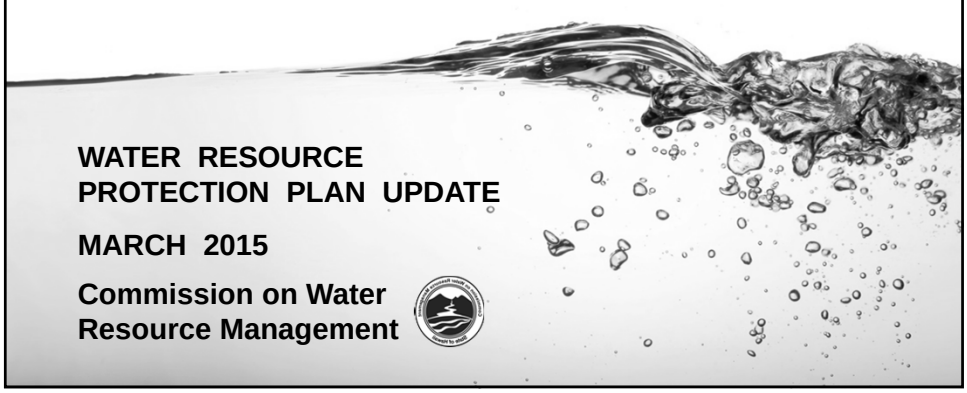
HAWAIʻI WATER WORKSHOPS



WATER RESOURCE PROTECTION PLAN UPDATE

MARCH 2015

Commission on Water Resource Management

Agenda

1. **Why Water?**
2. Water Management in Hawaiʻi
3. Commission on Water Resource Management
4. Where does our water come from?
5. Hawaiʻi Water Plan
6. Water Resource Issues
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8. Breakout Discussion
   Local Water Issues and Actions
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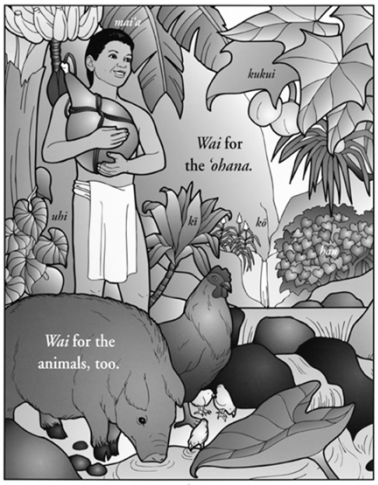
   Summary of Breakout Discussion
10. Next Steps

WHY WATER?

- The human body is up to 60% water
- All known organisms need at least some water to survive
- Water is essential for:
  - Public health
  - Food production
  - Cultural Practices
  - Recreation
  - Power Generation
  - Fire Protection
  - and much more!

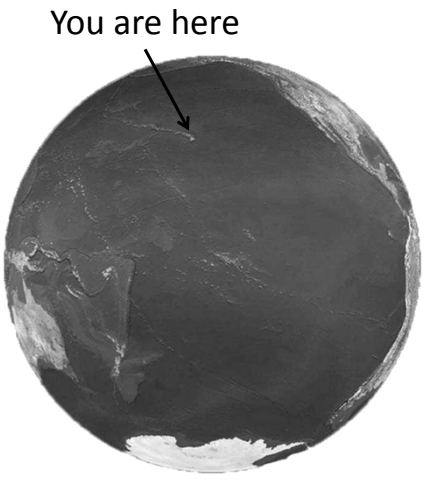


Source: Williams, Julie. 2006. Wai'anae: Where I Live. *Kamehameha Schools Press.*

WHY WATER?

Water covers 71% of the Earth's surface!

- The world's oceans contain 332.6 million cubic miles = 366 quintillion (3.66×10^{20}) gallons of water
- That's about 97% of all water on Earth (USGS)



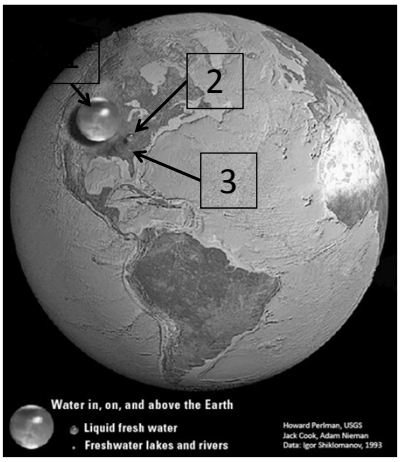
Source: USGS Water Science for Schools
http://water.usgs.gov/edu/watercycleoceans.html

WHY WATER?

Only about 1% 2 of all of the water on Earth is fresh water

All Earth's water, liquid fresh water, and water in lakes and rivers. Spheres showing:

1. All water (sphere over western U.S., 860 miles in diameter) is 0.1% of the size of the entire earth.
2. Fresh liquid water in the ground, lakes, swamps, and rivers (sphere over Kentucky, 169.5 miles in diameter), is 0.00004% of the size of the entire earth.
3. Fresh-water in lakes and rivers (sphere over Georgia, 34.9 miles in diameter) is 0.00000004% of the size of the entire earth.



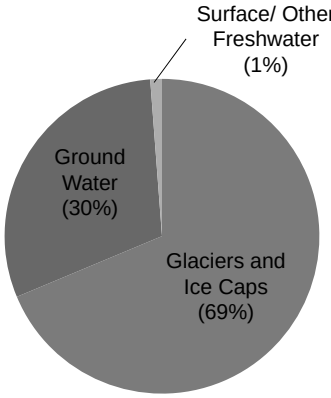
Source: Woods Hole Oceanographic Institution & USGS Water Science School
http://water.usgs.gov/edu/earthwherewater.html

WHY WATER?

Of the fresh water on Earth…

- Most of the fresh water is locked up in glaciers and ice caps and is unusable
- Surface water (streams, rivers, lakes, etc.) serves most of life's fresh water needs, but accounts for only 1% of the fresh water on Earth.

Where is the Earth's Fresh Water?



Source: USGS Water Science School
http://water.usgs.gov/edu/earthwherewater.html

Hawai‘i’s Natural Water Systems

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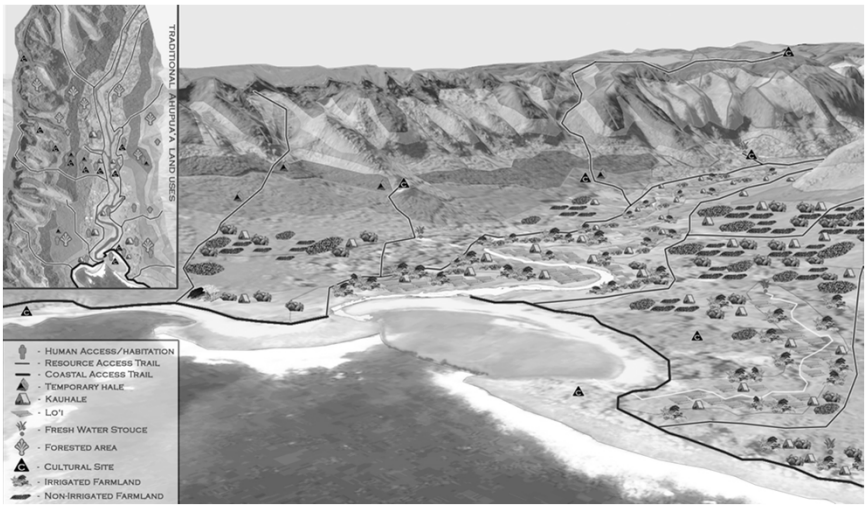
Water Management in Hawai‘i



Water Management in Hawai‘i

The Hawaiian language and culture has hundreds of “WAI” words and place names

- Huawai
- Kahewai
- KawaihaeKauluwai
- Kawaihau
- Kawaihoa
- Kawai Iki
- Kawaikini
- Kawailena
- Kawailoa
- Kawaipapa
- Kawaipoko
- Kawai‘ula
- Kūmelewai
- Kunawai
- Lo‘ipūnāwai
- Lokowaiaho
- Luawai
- Manawai
- Muliwai
- Nāwaihulili
- Nininiwai
- Niuhelewai
- Papawai
- Piliwai
- Pūhāwai
- Pu‘ukawaiwai
- Pu‘uwaihu‘ena
- ‘Umiwai
- Waiāhole
- Waiakamilo
- Waiākea
- Wai‘alalā
- Wai‘alae
- Wai‘ale‘ale
- Wai ali‘i
- Wai‘anae
- Wai ani ani
- Wai ‘apo
- Wai au
- Wai ‘eli
- Wai hā
- Wai hau
- Waiholomoku
- Waihona
- Wai hū
- Wai kahe
- Wai kai
- Wailana
- Wailele
- Waikalua
- Waikamoi
- Waikāne
- Waikapuna
- Waikele
- Waiki‘i
- Waikīkī
- Waikoloa
- Wailea
- Waimānalo
- Waimea
- Waipahu
- Waipi’o
- Waiwai

Water Management in Hawai‘i

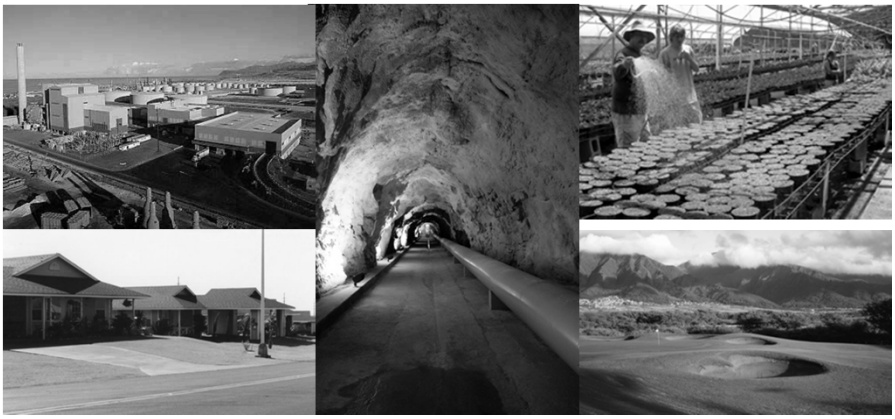
1840 Constitution

“Kamehameha I, was the founder of the kingdom,
and to him belonged the land
from one end of the Islands to the other,
though it was not his own private property.

It belonged to the people, and the chiefs in common,
of whom Kamehameha I was the head,
and had the management of the landed property.”

Water Management in Hawai‘i

The need for a different type of management



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.”*

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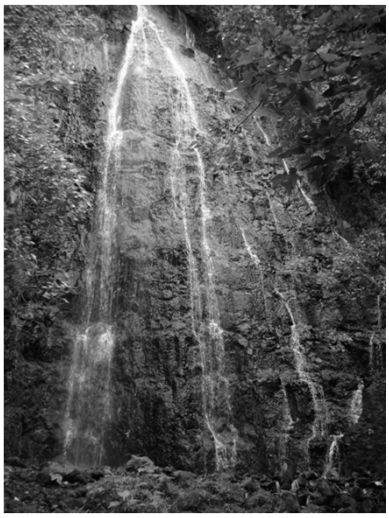


Commission on Water Resource Management

- Seven members
  - Five members are appointed by the Governor and confirmed by the State Senate
  - Chairperson of BLNR (Chair of Water Commission)
  - Director, State DOH (ex-officio voting member)
- Water **QUANTITY** is managed by CWRM (i.e. streams and ground water).
- Water **QUALITY** is managed by the Department of Health.

Commission on Water Resource Management

Branches

- Ground Water Regulation
- Stream Protection and Management
- Planning
- Survey

Commission on Water Resource Management

Public Trust Doctrine

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

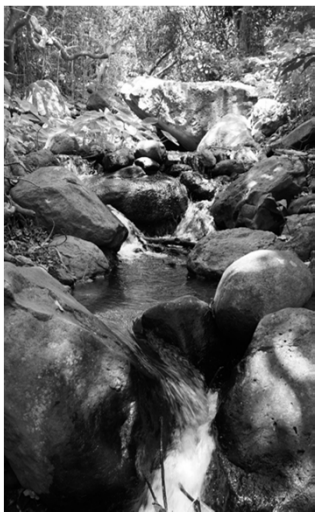
"The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people."

State Constitution, Article XI

Commission on Water Resource Management

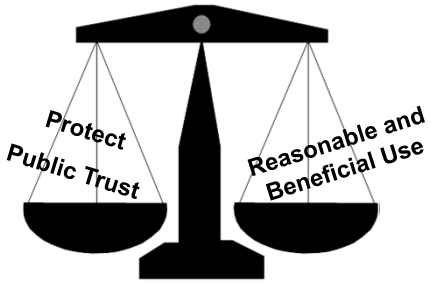
Precautionary Principle

There is a duty to take anticipatory action to prevent harm to public resources.



Commission on Water Resource Management

Protect the Public Trust and Ensure Reasonable and Beneficial Uses



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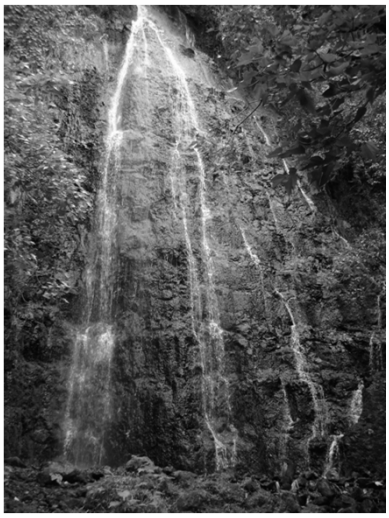
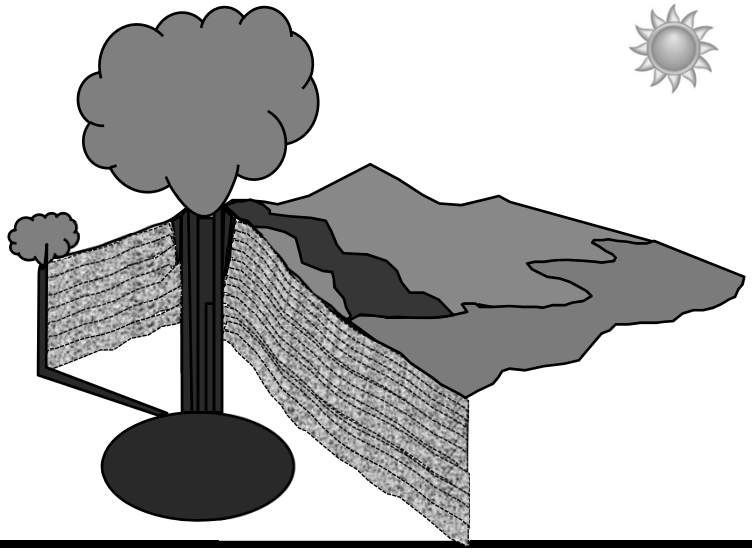
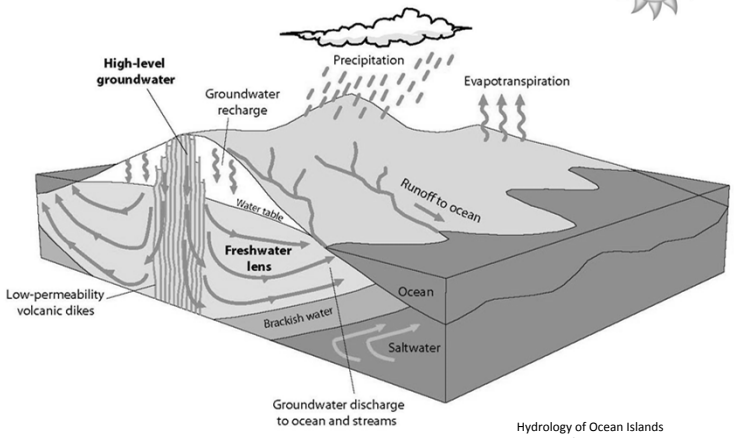


Where does our water come from?



Where does our water come from?

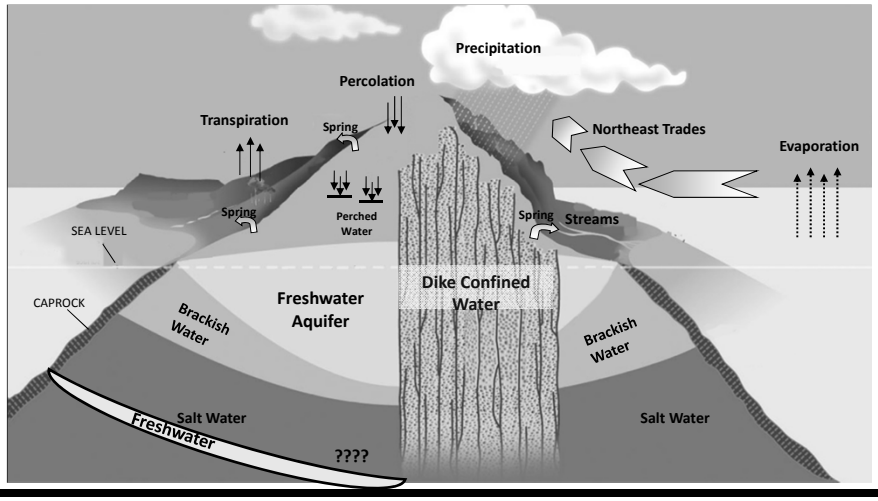
The Water Cycle



Hydrology of Ocean Islands
USGS Pacific Islands Water Science Center
http://hi.water.usgs.gov/studies/GWRP/islhydro.html

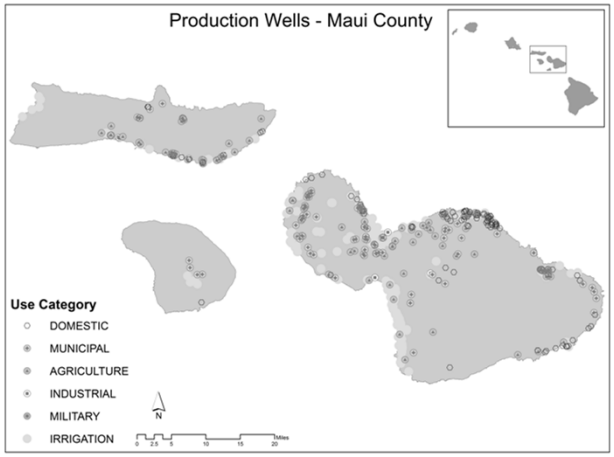
Where does our water come from?

Ground Water



Where does our water come from?

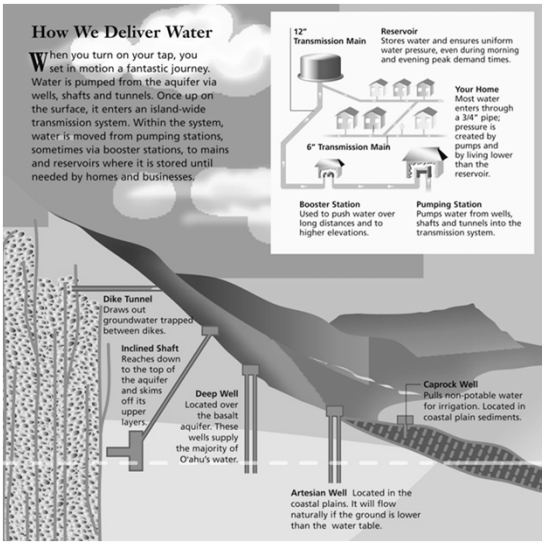
Ground Water



Where does our water come from?

Ground Water

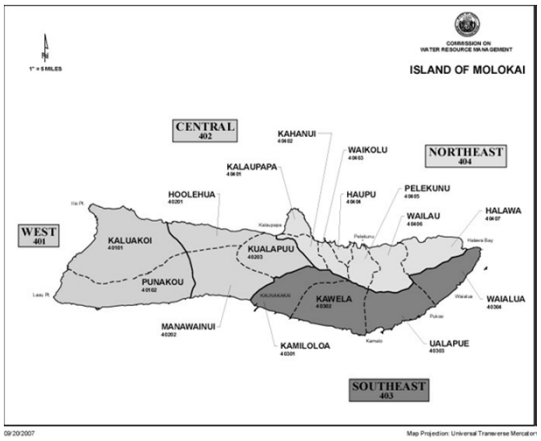
- Wells
- Shafts
- Tunnels



Source: Honolulu Board of Water Supply

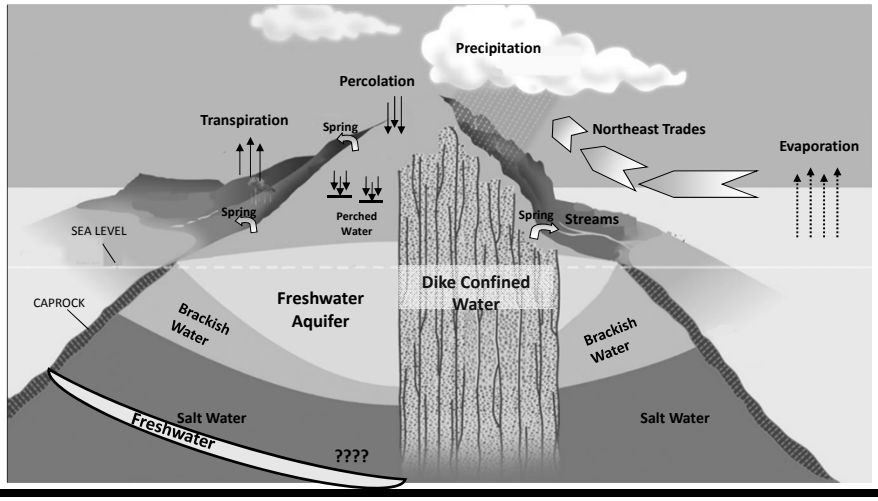
Where does our water come from?

Molokai's Ground Water Hydrologic Units



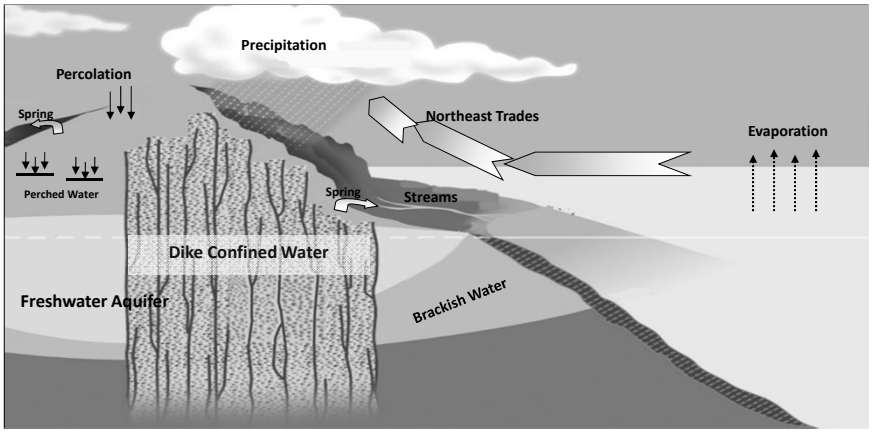
Where does our water come from?

Surface Water



Where does our water come from?

Surface Water



Where does our water come from?

Surface Water

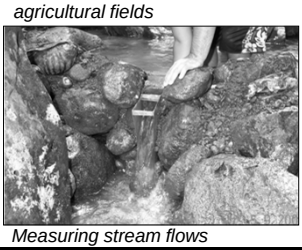
Pump near an auwai

Collection box along stream channel

Irrigation ditches carry water to agricultural fields

Pipe intake

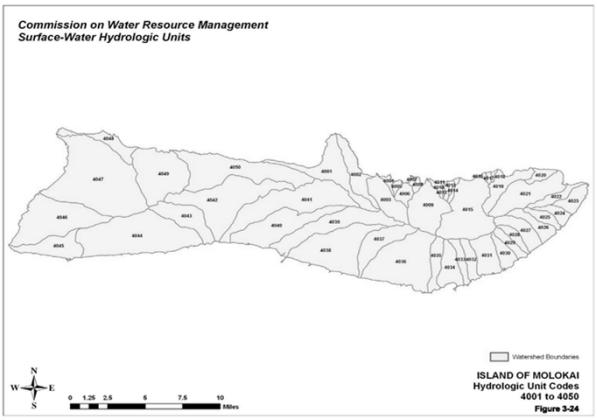
Beginning of an auwai



Measuring stream flows

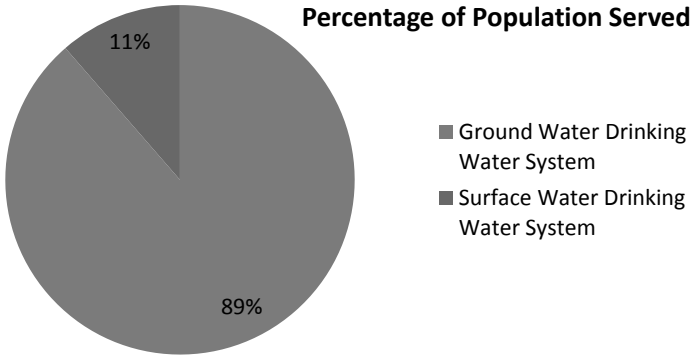
Where does our water come from?

Molokai's Surface Water Hydrologic Units



Where does our water come from?

In Hawai‘i most of our drinking water is ground water.



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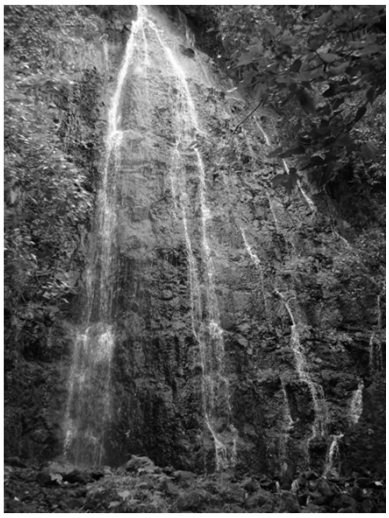


Hawai‘i Water Plan

*“There is a need for a program of **comprehensive water resources planning** to address the problems of supply and conservation of water.*

*The **Hawaii water plan**…is accepted as the guide for developing and implementing this policy.”*

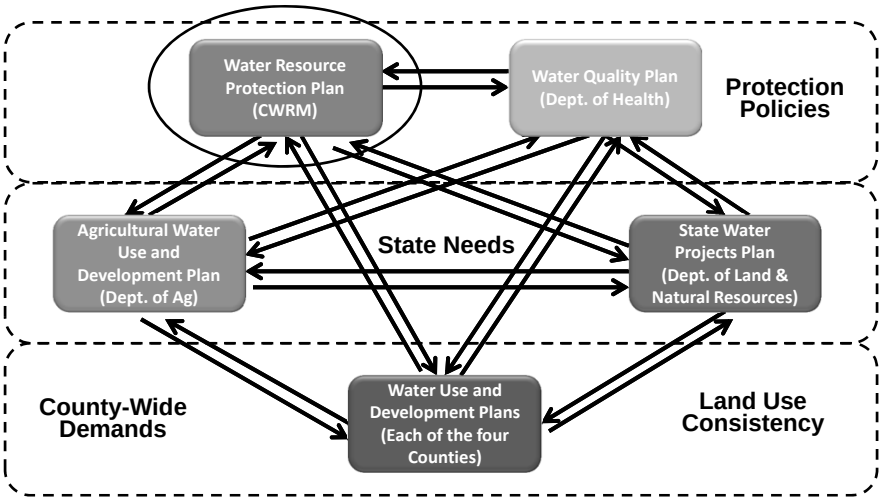
(§174C-2(b) HRS)
(Emphasis added)

Hawai‘i Water Plan

Objectives

- Set water resource policies
- Proper conservation and development of water
- Reasonable and beneficial use of water
- Ensure adequate water quality
- Control water for public purposes
- Protect water rights
- Recognize county home rule

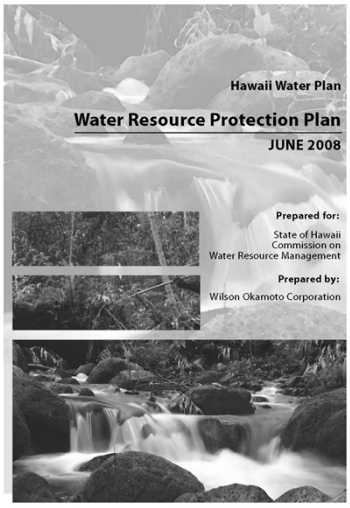
Hawai‘i Water Plan



Hawai‘i Water Plan

Water Resource Protection Plan (2008)

1. Introduction
2. General Water Resource Management Principles and Policies
3. Inventory and Assessment of Resources
4. Monitoring of Water Resources
5. CWRM Regulatory Programs
6. Existing and Future Demands
7. Resource Conservation and Augmentation
8. Drought Planning
9. Watershed Protection
10. Water Quality
11. Priority Recommendations and Implementation Plan
12. References



Hawai‘i Water Plan

WRPP Update (current)

Table of Contents

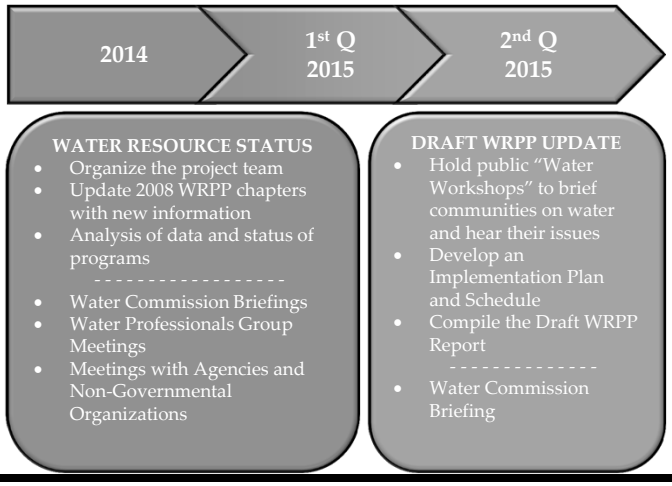
1. Introduction
2. Summary of Water Resource Trends and Issues
3. Action Plan
4. Plan Implementation

Appendices

A. Planning Context for the WRPP
B. Legal Authorities and Guidance
C. Stakeholder Outreach Process
D. Inventory and Assessment of Resources
E. Monitoring of Water Resources
F. CWRM Regulatory Programs
G. Existing and Future Demands
H. Resource Conservation and Augmentation
I. Drought Planning
J. Watershed Protection
K. Water Quality
L. Five-Year Action Plan Project and Program Descriptions
M. Long-Term Actions
N. Water Resource Agencies

Hawai‘i Water Plan

WRPP Update Process to Date



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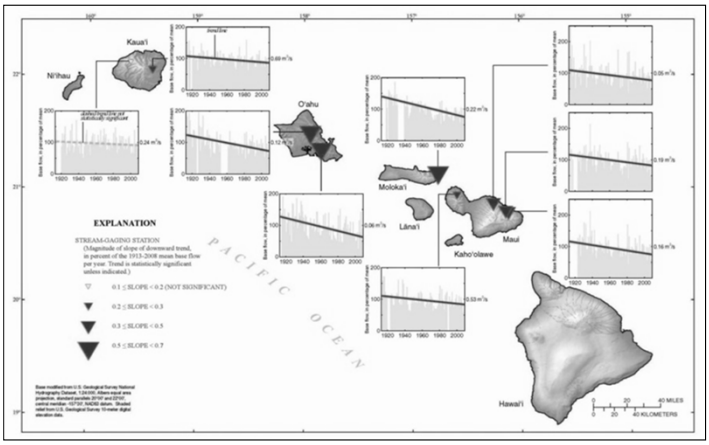
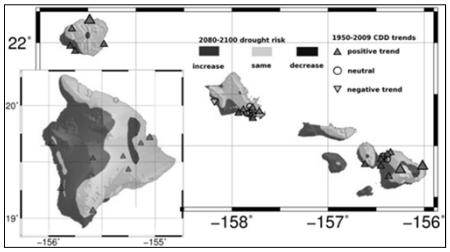
Water Resource Issues

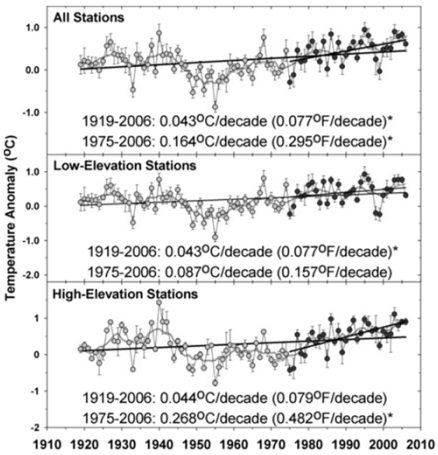
Climate Change



Water Resource Issues

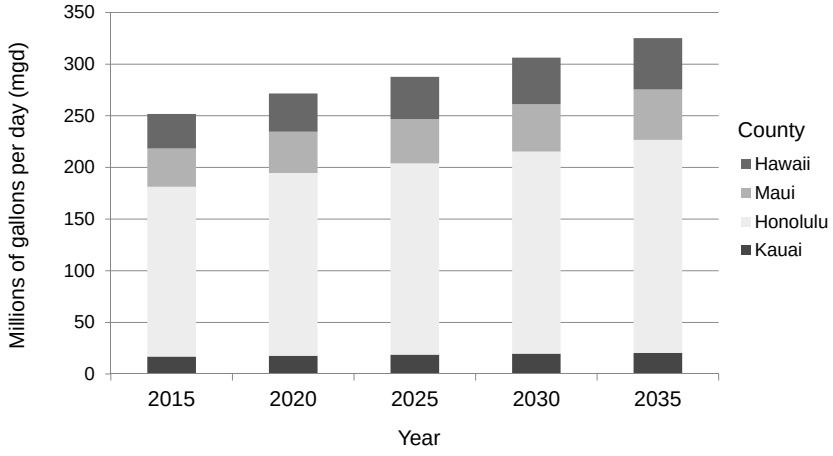
Climate Change





Water Resource Issues

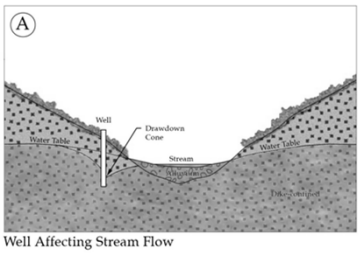
Increasing Water Demand



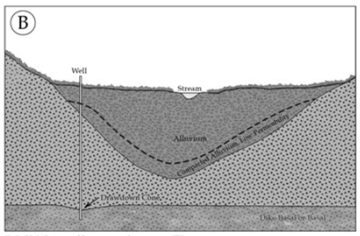
Water Resource Issues

Ground and Surface Water Interaction

- In some locations, ground water withdrawal affects the amount of water in nearby surface water bodies.
- There is a need to better understand these ground-surface water interactions in order to make better management decisions.



Well Affecting Stream Flow



Well Not Affecting Stream Flow

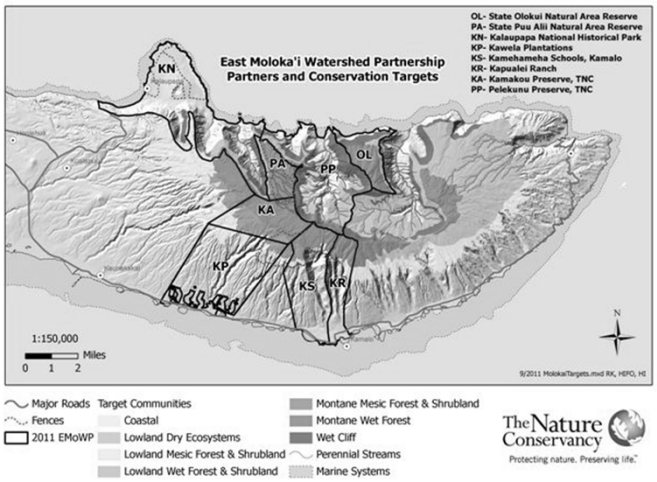
Water Resource Issues

Protection of Water Rights

- Correlative
- Riparian
- Appurtenant
- Traditional and Customary
- Department of Hawaiian Home Lands

Water Resource Issues

Watershed Management



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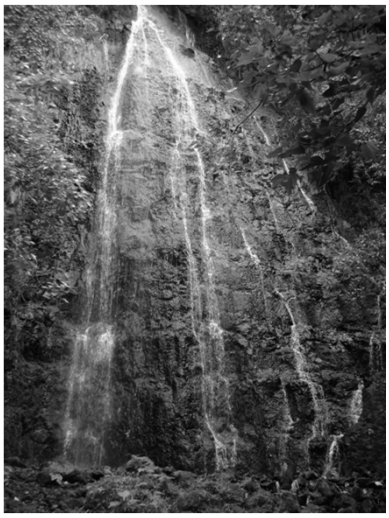
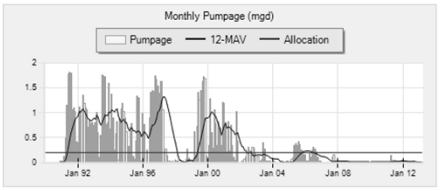
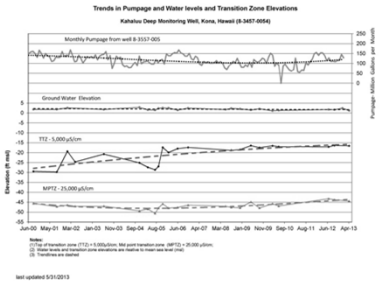


Water Management Strategies

Resource Monitoring

- Water Use Reporting
- Deep Monitor Wells
- Water Level Observation Wells
- Climate
- Chlorides
- Streamflow

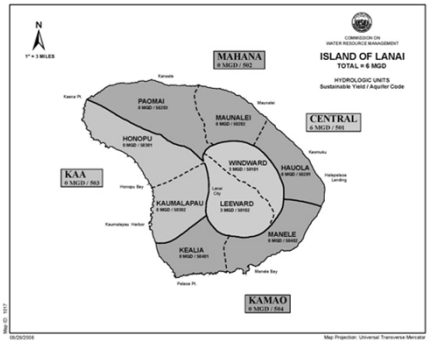




Water Management Strategies

Resource Assessments

Sustainable Yields



Instream Flow Standards

Water Management Strategies

Permitting and Enforcement

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

APPLICATION FOR SURFACE WATER USE PERMIT FOR *PROPOSED NEW USE* IN A DESIGNATED SURFACE WATER MANAGEMENT AREA

FORM SWUPA-N

For Official Use Only

APPLICANT INFORMATION:

SOURCE INFORMATION

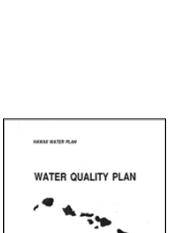
PROPOSED USE INFORMATION

PROPOSED USER INFORMATION

Water Management Strategies

Long-Range Planning

- Hawaii Water Plan
- Drought Planning
- Water Conservation Planning
- Resource Augmentation Planning
- Research and Studies
- Coordination and Outreach



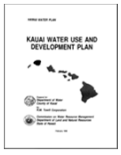
WATER QUALITY PLAN

STATE WATER PROJECTS PLAN

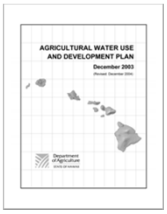
VOLUME 1

February 2003

KO'OLAU POKO WATERSHED MANAGEMENT PLAN



KAUAI WATER USE AND DEVELOPMENT PLAN



AGRICULTURAL WATER USE AND DEVELOPMENT PLAN

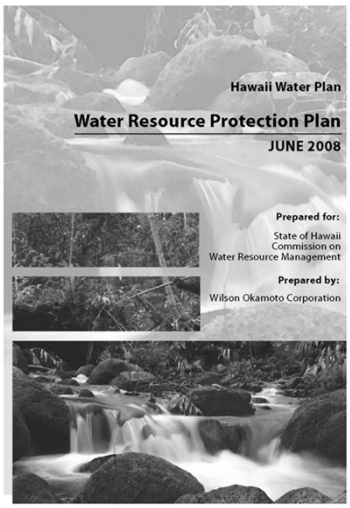
December 2003

HAWAII COUNTY WATER USE AND DEVELOPMENT PLAN UPDATE

Water Management Strategies

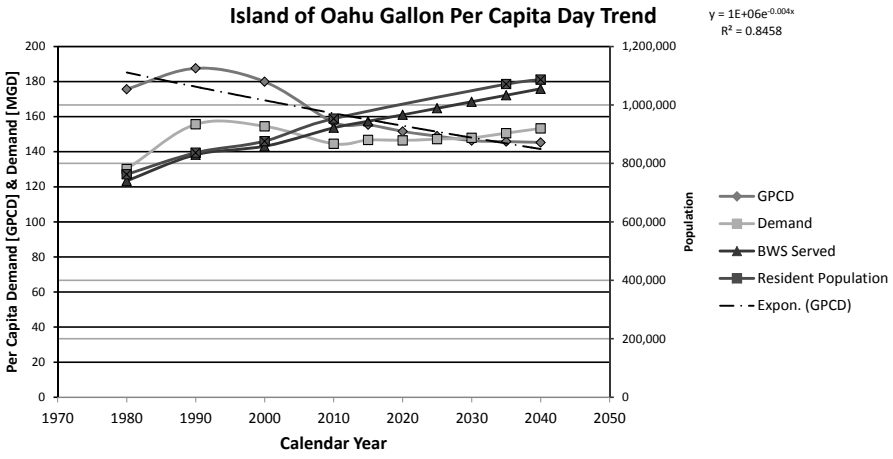
Implementation of 2008 WRPP

- 86 Actions Identified
- 58 Actions Implemented
- Focused on:
  - Monitoring and Data Collection;
  - Resource Investigations and Assessments; and
  - Water Conservation and Water Shortage Planning



Water Management Strategies

Conservation



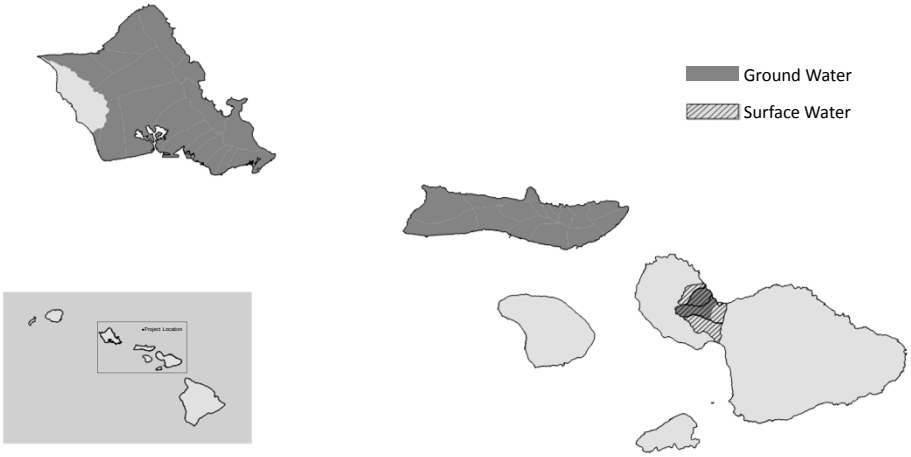
Water Management Strategies

Resource Augmentation

- Recycled Water
- Desalinated Water
- Storm Water
- Grey Water

Water Management Strategies

Water Management Areas



Agenda

1. Why Water?
2. Water Management in Hawai‘i
3. Commission on Water Resource Management
4. Where does our water come from?
5. Hawai‘i Water Plan
6. Water Resource Issues
7. Water Management Strategies
8. **Breakout Discussion**
   Local Water Issues and Actions
9. Reconvene
   Summary of Breakout Discussion
10. Next Steps

Breakout Discussion

45 minutes

Break out into small groups to allow for more detailed discussions on specific topics. We will reconvene after 45 minutes to share the top issues from each group.

Photo: Honolulu BWS

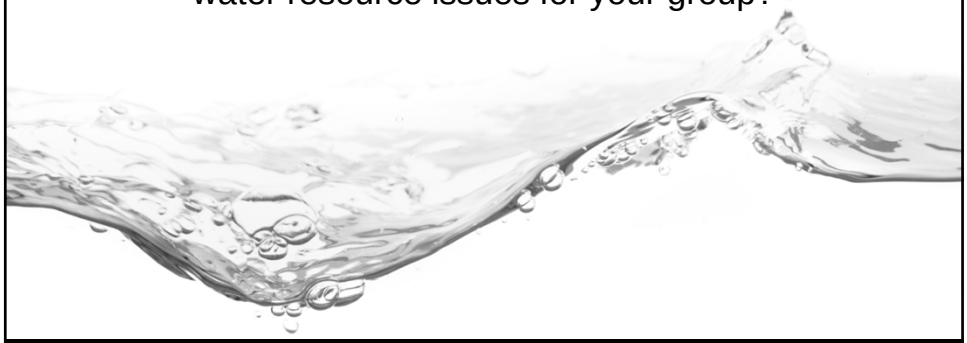
Breakout Discussion

What is your #1
water resource issue?

What can/should we do about it?

Reconvene Large Group

What were the top three
water resource issues for your group?



Next Steps

Hawai‘i Water Workshops 6:30 pm – 8:30 pm

March 3 - O‘AHU
DLNR Board Room
1151 Punchbowl Street

March 11 - LANA‘I
Lana‘i Senior Center
309 Seventh Street

March 12 – MAUI
Wailuku Community Center
395 Waena Place

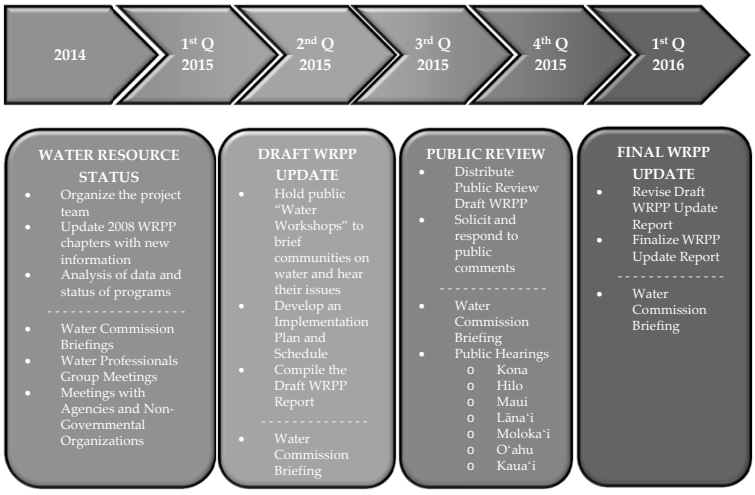
March 17 - MOLOKA‘I
DHHL/OHA Conference Room
600 Mauna Loa Highway, Suite D-2

March 19 - KAUA‘I
Planning Commission Meeting Room
4444 Rice Street

March 24 - KONA
West Hawai‘i Civic Center
Community Meeting Hale
74-677 Kealakehe Parkway

March 30 - HILO
Aupuni Center
101 Pauahi Street, Suite 1

Next Steps



Water Resource Protection Plan

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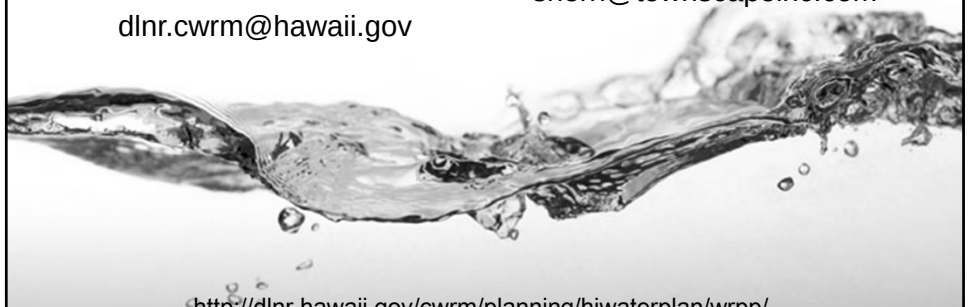

http://dlnr.hawaii.gov/cwrm/planning/hiwaterplan/wrpp/

Water Resource Protection Plan

Thank you!