

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843



June 18, 2013

KIRK CALDWELL, MAYOR

DUANE R. MIYASHIRO, Chairman
MAHEALANI CYPHER, Vice Chair
THERESIA C. McMURDO
ADAM C. WONG
KAULANA H. R. PARK

ROSS S. SASAMURA, Ex-Officio
GLENN M. OKIMOTO, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

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2013 JUN 18 AM 8:23

NOTICE

The Regular Meeting of the Board of Water Supply, will convene on Monday, June 24, 2013, at 2:00 p.m. in the Board Room, Public Service Building, 630 South Beretania Street, Honolulu, Hawaii.

SPEAKER REGISTRATION

The Board of Water Supply is committed to allowing public testimony at open meetings of the Board.

Please provide your name, phone number and subject matter of testimony when registering **prior to the day of the meeting** by one of the following options:

1. Emailing to board@hbws.org;
2. Faxing to 748-5079;
3. Calling 748-5061;
4. In person – 630 S. Beretania Street, Room 311

Persons wishing to testify may also register by filling out the registration form **on-site on the day of the meeting**.

Persons who have not registered to testify will be given an opportunity to speak on an item following the oral testimonies of the registered speakers.

Testimony is limited to three minutes and shall be presented by the registered speaker only.

WRITTEN TESTIMONY

Written testimony may be emailed to board@hbws.org or faxed to 748-5079, **prior to the day of the meeting**, for distribution at the meeting.

13 copies are requested if written testimony is submitted **on-site on the day of the meeting**.

If submitted, written testimonies, including the testifier's address, email address, and phone number may be posted on the Board of Water Supply website.

PHYSICALLY CHALLENGED REQUESTS

Any physically challenged person requiring special assistance should call 748-5061 for details **at least one day prior to the meeting date**.

The agenda for the June 24, 2013 Regular Meeting of the Board of Water Supply is as follows:

ITEMS REQUIRING BOARD ACTION

1. Approval of the Minutes of the Public Hearing and Regular Meeting Held on May 28, 2013
2. Adoption of State Revolving Fund Water System Revenue Loan Series 2013 Resolution No. 834, 2013, Authorizing Up to \$50,000,000 Principal Amount of Series 2013 Loans
3. Topics for Future Board Meetings
4. Election of the Chairman and Vice Chairman of the Board of Water Supply Beginning July 1, 2013

ITEMS FOR INFORMATION

1. Water System Revenue Bonds – Compliance with Rate Covenant
2. Recruitment Status
3. Water Main Repair Report for May 2013
4. Status Update of Groundwater Levels at All Index Stations
5. Water Resources Briefing

MINUTES

REGULAR MEETING OF THE BOARD OF WATER SUPPLY

June 24, 2013

At 2:04 PM on June 24, 2013 in the Board Room of the Public Service Building at 630 South Beretania Street, Honolulu, Hawaii, Board Chair Miyashiro called to order the Regular Meeting.

Present: Duane R. Miyashiro, Board Chair
Mahealani Cypher, Vice Chair
Theresa C. McMurdo
Kaulana H. R. Park
Adam C. Wong
Ross S. Sasamura

Also Present: Ernest Lau, Manager and Chief Engineer
Ellen Kitamura, Deputy Manager and Chief Engineer
Tracy Burgo
Alex Ubiadas
Daryl Hiromoto
Barry Usagawa
Karen Tom
Paul Kikuchi
Neil Oyama
Henderson Nuuhiwa
Sandy Moriki
Rommel Mangiliman
Teri Akana

Others Present: Winston Wong, Deputy Corporation Counsel
Krishna Jayaram, Deputy Corporation Counsel
Marilyn Ushijima, Deputy Corporation Counsel
Catherine Cruz, KITV
Chris Cleveland, Brown and Caldwell
Mike Hernandez-Soria, Hawaiian Cool Water LLC

Absent: Glenn M. Okimoto

APPROVAL
OF MINUTES

Approval of the Minutes of the Public Hearing and the Regular Meeting
held on May 28, 2013

MOTION
TO APPROVE

Ross Sasamura and Mahealani Cypher motioned and seconded,
respectively, to approve the Minutes of the Public Hearing and the Regular
Session Meeting of May 28, 2013. The motion was unanimously carried.

"June 24, 2013

ADOPTION OF
RESOLUTION
NO. 834, 2013

Chairman and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chairman and Members:

Subject: Adoption of State Revolving Fund Water System Revenue
Loan Series 2013 Resolution No. 834, 2013, Authorizing
Up to \$50,000,000 Principal Amount of Series 2013 Loans

We recommend adoption of State Revolving Fund (SRF) Water System Revenue Loan Series 2013 Resolution No. 834, 2013, authorizing up to \$50,000,000 aggregate principal amount of the Board of Water Supply's (BWS) SRF Water System Revenue Loans, Series 2013 (Series 2013 Loans).

The Series 2013 Loans provide moneys to pay the costs of improvements to the Water System authorized in the capital budget of the BWS and identified in the SRF 2013 Loan Agreements, to make a deposit to a SRF Series Reserve Account if applicable, and to pay costs of issuance of the Series 2013 Loans. The Series 2013 Loans are the fourth series of SRF Loans to be obtained by the BWS from the State Department of Health under and pursuant to the SRF General Resolution.

Resolution No. 834, 2013 further authorizes any Authorized Officer of the BWS, subject to limitations, the power to determine and carry out certain actions in connection with the issuance and execution of the Series 2013 Loans.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachment"

DISCUSSION: Manager Lau stated that this is a very good program for BWS and is supported by the U.S. Environmental Protection Agency. They distribute these funds to the State to create a revolving loan fund to help water agencies improve their water systems.

MOTION TO
APPROVE
RESOLUTION
NO. 834, 2013

Mahealani Cypher motioned to approve the Adoption of Resolution No. 834, 2013 and was seconded by Ross Sasamura. The motion was unanimously carried.

**BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU, HAWAII**

**STATE REVOLVING FUND
WATER SYSTEM REVENUE LOAN
SERIES 2013 RESOLUTION NO. 834, 2013**

**AUTHORIZING UP TO
\$50,000,000 PRINCIPAL AMOUNT OF SERIES 2013 LOANS**

ADOPTED JUNE 24, 2013

TABLE OF CONTENTS

	Page
ARTICLE I	DEFINITIONS AND STATUTORY AUTHORITY7
Section 1.01.	Series 2013 Resolution; Findings and Determination.....7
Section 1.02.	Definitions.....7
Section 1.03.	Authority for the Series 2013 Resolution.....8
ARTICLE II	AUTHORIZATION, TERMS AND OBTAINING OF SERIES 2012 LOANS.....8
Section 2.01.	Authorization of Series 2013 Loans, Principal Amount, Designation and Title.....8
Section 2.02.	Purposes.....8
Section 2.03.	Delegation of Authority.....8
Section 2.04.	Authority to Enter into Series 2013 Loan Agreements.....10
Section 2.05.	Execution of Documents.....10
ARTICLE III	APPLICATION OF PROCEEDS.....10
Section 3.01.	Application of Proceeds.....10
ARTICLE IV	MISCELLANEOUS.....10
Section 4.01.	Effectiveness.....10

STATE REVOLVING FUND
WATER SYSTEM REVENUE LOAN
SERIES 2013 RESOLUTION NO. 834, 2013

AUTHORIZING UP TO
\$50,000,000 PRINCIPAL AMOUNT OF SERIES 2013 LOANS

BE IT RESOLVED by the Board of Water Supply of the City and County of Honolulu, Hawaii (the "Board"), as follows:

ARTICLE I

DEFINITIONS AND STATUTORY AUTHORITY

Section 1.01. Series 2013 Resolution; Findings and Determination. (1) This State Revolving Fund Water System Revenue Loan Series 2013 Resolution authorizing up to \$50,000,000 principal amount of Series 2013 Loans is supplemental to, and constitutes a Series Resolution within the meaning of and is adopted in accordance with Article IX of, the Resolution, as hereinafter defined.

(2) It is hereby found and determined by the Board that it is necessary and desirable that the Board obtain from the Department of Health at this time one or more Loans to be designated as provided herein to provide monies to carry out one or more purposes of the Board.

Section 1.02. Definitions. (1) All terms which are defined in Section 1.01 of the Resolution shall have the same meanings, respectively, in this Series 2013 Resolution as such terms are given in said Section 1.01 of the Resolution.

(2) In addition, as used in this Series 2013 Resolution, unless the context shall otherwise require, the following terms shall have the following respective meanings:

"Resolution" means that certain resolution adopted by the Board on February 23, 2004 entitled "A Resolution Authorizing and Providing for State Revolving Fund Loans to be Obtained from time to time from the State of Hawaii Department of Health by the Board of Water Supply of the City and County of Honolulu, Hawaii, for the Purposes of the Water System of the City and County; Covenanting as to Establishment, Maintenance, Revision and Collection of Charges and Rates for the Use and Services of the Water System and the Collection and Disbursement of Revenues Derived therefrom; Pledging on a Junior and Subordinate Basis the Net Revenues Derived from the Water System to the Payment of the Principal of and Interest on such Loans as the same Fall Due; Creating and Establishing Certain Funds and Accounts; Setting Forth the Limitations or Conditions upon the Obtaining of Additional Loans Payable from such Revenues and Making Other Covenants and Agreements in connection with the Foregoing" as amended and supplemented.

"Series 2013 Loans" mean the Loans authorized by Article II of this Series 2013 Resolution.

“Series 2013 Project” means the Improvements authorized in the capital budget of the Board and identified in one or more Series 2013 SRF Loan Agreements to be financed.

“Series 2013 Resolution” means this State Revolving Fund Water System Revenue Loan Series 2013 Resolution authorizing up to \$50,000,000 principal amount of the Series 2013 Loans.

“SRF Series 2013 Loan Agreements” means one or more commitment letter or interim and final Loan Agreements to be entered into between the Department of Health and the Board pursuant to which the Department of Health is to make one or more loans to the Board and the Board is to obtain one or more of such loans from the Department of Health to finance the Improvements identified therein constituting a part of the Series 2013 Project.

(3) Words of any gender shall be deemed and construed to include correlative words of the other genders. Unless the context shall otherwise indicate, words importing the singular number shall include the plural number and vice versa, and words importing persons shall include firms, associations and corporations, including public bodies, as well as natural persons.

(4) The terms “hereby”, “hereof”, “hereto”, “herein”, “hereunder”, and any similar terms, as used in this Series 2013 Resolution, refer to this Series 2013 Resolution.

Section 1.03. Authority for the Series 2013 Resolution. This Series 2013 Resolution is adopted pursuant to the provisions of the Act and the Resolution.

ARTICLE II

AUTHORIZATION, TERMS AND OBTAINING OF SERIES 2013 LOANS

Section 2.01. Authorization of Series 2013 Loans, Principal Amount, Designation and Title. One or more Loans (collectively, the “Series 2013 Loans”) entitled to the benefit, protection and security of the Resolution is hereby authorized to be obtained from the Department of Health in an aggregate principal amount not to exceed \$50,000,000. The Series 2013 Loans may be initially obtained on different dates; provided that no Series 2013 Loan shall be obtained later than six years from the date of adoption of this Series 2013 Resolution. For purposes of this Series 2013 Resolution, a Series 2013 Loan is obtained when the Board signs an agreement to receive money from the Department of Health and the amount of the Series 2013 Loan is the actual amount that the Board receives.

Section 2.02. Purposes. The purposes for which the Series 2013 Loans are being issued are (1) to pay the Costs of Improvements constituting the Series 2013 Project; (2) to make such deposit to the SRF Series Reserve Account in the SRF Revenue Fund as may be necessary in connection with obtaining the Series 2013 Loans; and (3) to pay the costs of obtaining of the Series 2013 Loans.

Section 2.03. Delegation of Authority. (1) There is hereby delegated to any Authorized Officer of the Board, subject to the limitations contained herein and in the Resolution

and the Act, the power with respect to the Series 2013 Loans to determine and carry out the following:

(a) The terms and provisions of each Series 2013 Loan to be obtained from the Department of Health to finance the cost of one or more Improvements; *provided, however*, that all terms and provisions shall be in the best interest of the Board and shall carry out the purposes of the Board;

(b) The principal amount and designation and title of each Series 2013 Loan to be obtained; *provided however*, that the principal amount of all Series 2013 Loans shall not exceed \$50,000,000 or, together with other bonds and loans of the Board, any applicable limit approved by the City Council to be issued or obtained by the Board;

(c) The specific Improvements constituting the Series 2013 Project to be financed from the proceeds of the Series 2013 Loans;

(d) The date or dates, maturity date or dates and principal amount of each maturity of each 2013 Loan;

(e) The interest rate or rates of each Series 2013 Loan, the date from which interest on such Series 2013 Loan shall accrue, the dates on which interest on such Series 2013 Loan shall be payable, if any; *provided, however*, that the true interest cost (as determined by an Authorized Officer of the Board, which determination shall be conclusive) on the Series 2013 Loans shall not exceed eight percent (8%) per annum;

(f) The Paying Agent or Paying Agents for the Series 2013 Loans and the place or places of payments of the principal, Sinking Fund Installments, if any, prepayment price of and interest on the Series 2013 Loans, if other than the Board;

(g) The prepayment prices, if any, and the prepayment terms, if any, for the Series 2013 Loans, *provided, however*, that the prepayment price of Series 2013 Loans at the election or direction of the Board shall not be greater than one hundred three percent (103%) of the principal amount of the Series 2013 Loans to be prepaid, plus accrued interest thereof to the prepayment date;

(h) Any provisions with respect to funds and accounts and subaccounts therein, if applicable, and the Revenues and application thereof, as provided in Article V of the Resolution;

(i) Whether a SRF Series Reserve Account shall be established for the Series 2013 Loans, and if so determined to be established, the amount of the SRF Series Reserve Account Requirement and the method of funding or providing for such SRF Series Reserve Account Requirement, and any provisions with respect to subaccounts therein, if applicable, and the Revenues and application thereof, as provided in Article V of the Resolution;

(j) Directions for the application of the proceeds of each Series 2013 Loan, including the interest on the Series 2013 Loans to be capitalized from the proceeds thereof, if any, and the date or dates to which such capitalized interest shall accrue; and

(k) Any other provisions deemed advisable by an Authorized Officer of the Board, not in conflict with the provisions hereof or of the Resolution.

(2) Such Authorized Officer shall set forth in the Series 2013 Loan Agreements the determinations or other actions taken pursuant to the authority granted herein or in the Resolution and any such Series 2013 Loan Agreements shall be conclusive evidence of the action or determination of such Authorized Officer as to the matters stated therein.

Section 2.04. Authority to Enter into Series 2013 Loan Agreements. Any Authorized Officer of the Board is hereby authorized to execute, and acknowledge and agree to, one or more Series 2013 Loan Agreements in the name and on behalf of the Board in substantially the form as presented at the meeting at which this Series 2013 Resolution is adopted, which form is hereby approved, with such changes, insertions and omissions as may be approved by such Authorized Officers, such execution and acknowledgement and agreement being conclusive evidence of such approval; provided that no Series 2013 Loan Agreement shall be entered into later than six years from the date of adoption of this Series 2013 Resolution

Section 2.05. Execution of Documents. Any Authorized Officer of the Board is hereby authorized to execute and deliver, in the name and on behalf of the Board, any and all documents and instruments, and to do and cause to be done any and all acts and things, such Authorized Officer deems necessary or advisable in connection with obtaining the Series 2013 Loans from the Department of Health and to carry out the transactions contemplated by this Series 2013 Resolution.

ARTICLE III

APPLICATION OF PROCEEDS

Section 3.01. Application of Proceeds. On the date each Series 2013 Loan is obtained, the proceeds of such Series 2013 Loan shall be applied in accordance with the written direction of any Authorized Officer given pursuant to Section 2.03(1)(j) of this Series 2013 Resolution.

ARTICLE IV

MISCELLANEOUS

Section 4.01. Effectiveness. The Series 2013 Resolution shall become effective immediately upon its adoption.

INTRODUCED BY:



(BR)

DUANE R. MIYASHIRO, CHAIRMAN

June 24, 2013

DATE

ADOPTION OF STATE REVOLVING FUND WATER
SYSTEM REVENUE LOAN SERIES 2013 RESOLUTION
NO. 834, 2013, AUTHORIZING UP TO \$50,000,000
PRINCIPAL AMOUNT OF SERIES 2013 LOANS WAS
APPROVED ON JUNE 24, 2013

	AYE	NO	COMMENT
DUANE R. MIYASHIRO			
MAHEALANI CYPHER			
THERESIA C. MCMURDO			
ADAM C. WONG			
KAULANA H. R. PARK			
ROSS S. SASAMURA			
GLENN M. OKIMOTO			

APPROVED AS TO FORM AND LEGALITY THIS: June 24, 2013
DATE



DEPUTY CORPORATION COUNSEL
CITY AND COUNTY OF HONOLULU

"June 24, 2013

TOPICS FOR
FUTURE BOARD
MEETINGS

Chairman and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chairman and Members:

Subject: Topics for Future Board Meetings

We would like to take this time to allow the members of the Board to inform us of any topic or concern pertaining to Board of Water Supply operations that the Board would want addressed at future Board Meetings.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer"

DISCUSSION:

Board Member McMurdo stated that she previously requested a Communications Plan and would like to see this at the next Board meeting. Board Member Park suggested at least having updates until a formal plan was completed. Mr. Lau informed the Board that they will present a Communications plan at the next meeting. Ms. McMurdo and Vice Chair Cypher both volunteered to assist in developing the plan. Mr. Miyashiro also offered to work with the Manager to accomplish having the plan completed by the next meeting. Mr. Lau thanked the members.

Ms. McMurdo requested that in the future, a list of previously requested topics be included with this item, with a timetable of when the topics will be presented. Mr. Lau informed the Board that he does keep a running list and tries not to have too many items on one agenda so that the meetings do not run too long. Mr. Miyashiro informed the Board that he is privy to this list and that he works with Mr. Lau on the agenda prior to each meeting to keep the meetings within a reasonable time.

"June 24, 2013

**ELECTION OF
CHAIRMAN AND
VICE CHAIRMAN**

Chairman and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chairman and Members:

Subject: Election of the Chairman and Vice Chairman of the Board
of Water Supply Beginning July 1, 2013

The Bylaws of the Board of Water Supply provides that the Chairman and Vice Chairman of the Board shall be elected annually from among and by the appointed members of the Board at the first regular meeting in June.

Accordingly, election of the Chairman and Vice Chairman of the Board for the ensuing year commencing July 1, 2013, is now in order.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer"

**NOMINATION
AND MOTION**

Mahealani Cypher nominated Duane Miyashiro for Board Chair and was seconded by Theresia McMurdo. Adam Wong nominated Mahealani Cypher for Board Vice Chair and was seconded by Kaulana Park. Both Duane Miyashiro and Mahealani Cypher were unanimously elected to serve as Chairman and Vice Chair, respectively, of the Board of Water Supply for the ensuing year commencing July 1, 2013.

DUANE MIYASHIRO ELECTED AS CHAIRMAN AND MAHEALANI CYPHER ELECTED AS VICE CHAIR OF THE BOARD OF THE BOARD OF WATER SUPPLY FOR THE ENSUING YEAR COMMENCING JULY 1, 2013, AT THE JUNE 24, 2013 BOARD MEETING			
	AYE	NO	COMMENT
DUANE R. MIYASHIRO	X		
MAHEALANI CYPHER	X		
THERESIA C. MCMURDO	X		
ADAM C. WONG	X		
KAULANA H. R. PARK	X		
ROSS S. SASAMURA	X		
GLENN M. OKIMOTO			ABSENT

ITEM FOR INFORMATION NO. 1

"June 24, 2013

WATER SYSTEM
REVENUE
BONDS -
COMPLIANCE
WITH RATE
COVENANT

Chairman and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chairman and Members:

Subject: Water System Revenue Bonds – Compliance with
Rate Covenant

In accordance with Article VIII, Section 8.02, Rates and Charges, of the Water System Revenue Bonds, Resolution No. 717, 2001, we have completed a review of the financial condition of the Board of Water Supply for the purpose of estimating whether the Net Revenues for the current fiscal year and the next succeeding fiscal year will be sufficient to comply with the rate covenant in Section 8.02.

Our review included an examination of the financial and accounting records which we considered necessary to express an opinion on the adequacy of the department's rates and other charges such that Net Revenues shall not be less than the Net Revenue Requirement in each fiscal year.

In our opinion, Net Revenues for fiscal years 2013 and 2014 will not be less than the Net Revenue Requirement for such fiscal years.

The attached schedules present the actual and estimated revenues and expenditures in compliance with the above rate covenant.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachments"

The foregoing was for information only.

DISCUSSION: Mr. Lau presented the Department's compliance with its Net Revenue Disclosure as required by Bond Covenants. He indicated that the Department meets the minimum and target debt coverage ratio of 1.2 and 1.6, respectively. He also informed the Board that the projected fiscal year 2013 and 2014 ratios of 2.86 and 2.74, respectively, indicate that the Department maintains a strong financial position.

Ms. McMurdo inquired what the current bond rating was. Mr. Lau replied that the current rating from Moody's is AA2 and AA+ from Fitch.

Mr. Wong inquired if there are any other financial requirements. Chief Financial Officer Paul Kikuchi responded that they have an operating reserve requirement of 45 days and a target of 60 days. He also stated that the Department exceeded its target with approximately 65 days of operating reserve.

BOARD OF WATER SUPPLY

CALCULATIONS OF NET REVENUES AND NET REVENUE REQUIREMENT
FISCAL YEAR ENDING JUNE 30, 2014

		PROJECTED FY 2014
REVENUES		
Water sales	\$	196,244,400
Other charges & services		5,007,600
Interest revenue		<u>2,266,000</u>
Total revenues	\$	<u>203,518,000</u>
DEDUCTIONS		
Operating expenses	\$	<u>147,300,368</u>
Net revenues	\$	<u>56,217,632</u>
NET REVENUE REQUIREMENT		
Greater of:		
1) Aggregate debt service for FY 14	\$	20,515,000
Est. payments – SRF loans		<u>2,681,000</u>
	\$	<u>23,196,000</u>
2) Aggregate debt service for FY 14	\$	20,515,000
		<u>x 1.20</u>
	\$	24,618,000
	\$	<u>24,618,000</u>
Target Net Requirement of 1.6	\$	<u>32,824,000</u>
Current Ratio		<u>2.74</u>

**Board of Water Supply
City and County of Honolulu**
SUPPLEMENTAL SCHEDULE OF NET REVENUE REQUIREMENT
As of June 30, 2013

	<u>Actual July 1, 2012- May 31, 2013</u>	<u>Projected June 1, 2013 - June 30, 2013</u>	<u>Total</u>
REVENUES:			
Water sales	\$ 165,298,919	\$ 15,027,174	180,326,093
Interest	2,383,071	216,643	2,599,714
Other	<u>4,112,873</u>	<u>373,898</u>	<u>4,486,770</u>
Total revenues	<u>171,794,862</u>	<u>15,617,715</u>	<u>187,412,577</u>
DEDUCTIONS:			
Operating expenses	149,365,785	18,078,708	167,444,493
Less depreciation expense	<u>(35,245,424)</u>	<u>(3,500,000)</u>	<u>(38,745,424)</u>
Total deductions	<u>114,120,362</u>	<u>14,578,708</u>	<u>128,699,069</u>
Net revenues	<u>\$ 57,674,501</u>	<u>\$ 1,039,007</u>	<u>58,713,508</u>
NET REVENUE REQUIREMENT:			
Greater of:			
1) Aggregate debt service			20,504,053
Required deposits - subordinate obligation fund			<u>2,329,000</u>
			<u>22,833,053</u>
2) Aggregate debt service			20,504,053
			<u>1.20</u>
			<u>24,604,864</u>
Net revenue requirement			<u>24,604,864</u>
Target Net Requirement of 1.6			32,806,485
Current ratio			2.86

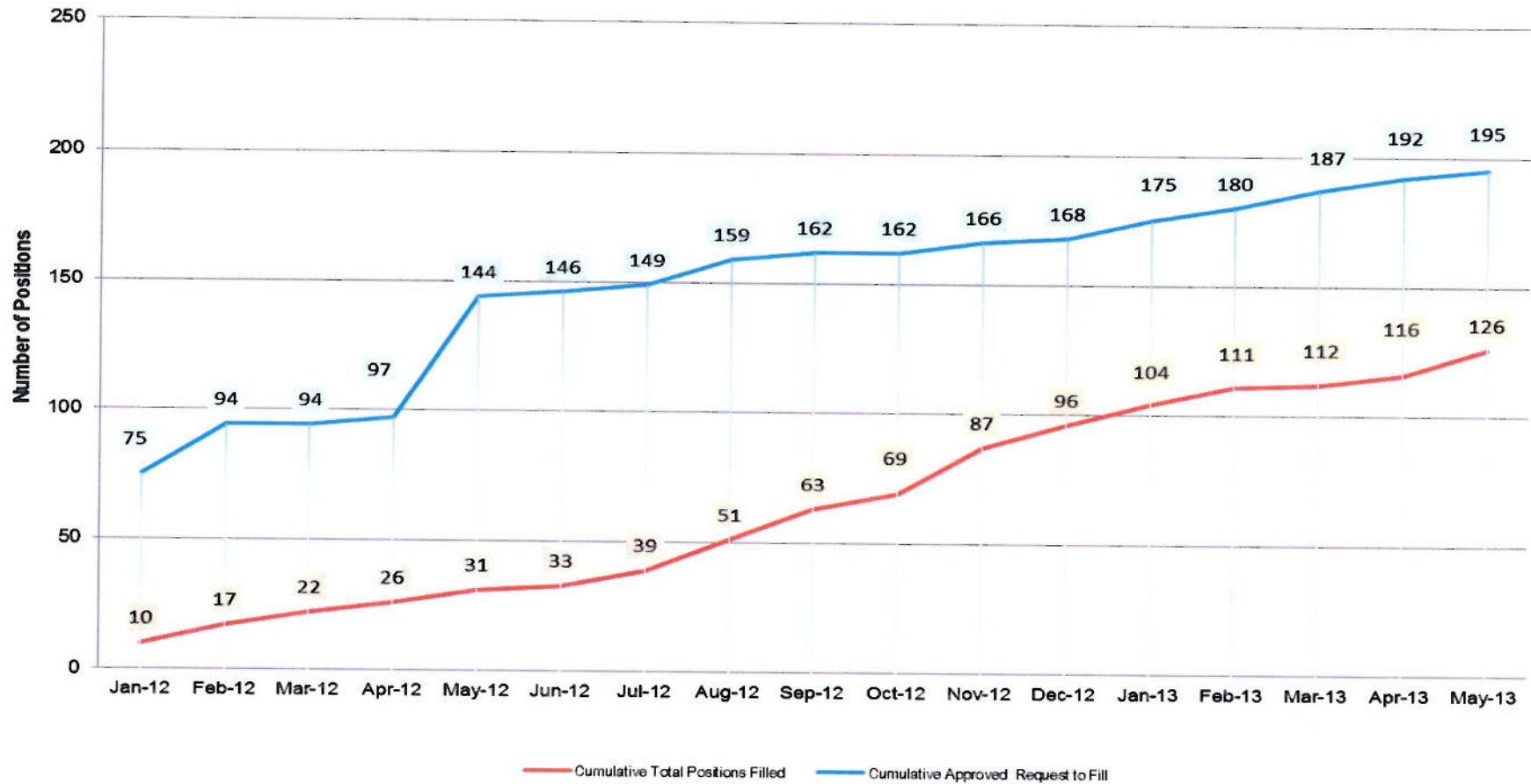
Note: Subject to change after year end adjustments

ITEM FOR INFORMATION NO. 2

Positions Filled January 1, 2012 through May 31, 2013



Cumulative Totals January 1, 2012 through May 31, 2013



DISCUSSION:

Mr. Wong inquired about the probability of recruiting people, given the current marketplace. Karen Tom of the Human Resources Office replied that they face the problem of government not being as competitive, salary wise, as private firms. She stated that they have had success in hiring people who have retired from the Federal Government, seeking a second career. Ms. Cypher expressed her concern about people working at BWS just to get vested in the retirement system and wants to be sure BWS reaches out to all possible opportunities and not rely only on those who are well experienced. Mr. Lau commented that sometimes they need the help right away so they need the well experienced, qualified people who require minimum guidance. In the meantime, they are still hiring at entry level and interns as well. Ms. McMurdo inquired about the amount of interns they currently have and if it is limited by the number of people interested or limited by cost. Ms. Tom replied that they currently have four interns and the amount is limited by the number of positions they have available.

Ms. McMurdo inquired about referrals. If, for example, an environmental engineer was referred to BWS but a civil engineer was needed, could the Department have a training program so the environmental engineer could perform the civil engineer duties? Mr. Lau responded that there are minimum qualifications to meet and a certain level of education in the specialized field is required. He added that referrals are helpful, however, referrals are still required to go through the competitive interview process and they may or may not fit the Department's needs.

Ms. McMurdo inquired if BWS has a career outreach program where employees go out to high schools to talk about different careers. Ms. Tom replied that the Communications Office goes out to the elementary schools. Board Member Sasamura questioned if the Hawaii Water Works Association (HWWA) had an outreach program and explained that when he was active in the American Public Works Association, they worked with high schools and provided career guidance. Mr. Lau replied that the HWWA does not have an outreach program with the schools.

Ms. McMurdo suggested the BWS present awards to students who participate in science fairs. Mr. Lau stated that they currently do this. Ms. Cypher stated that it's important to look at all possible outreach opportunities. Mr. Lau informed the Board that the Water System Operations Division is working on creating an apprenticeship program, similar to the multi-skilled worker program. Ms. McMurdo suggested working with University of Hawaii West Oahu.

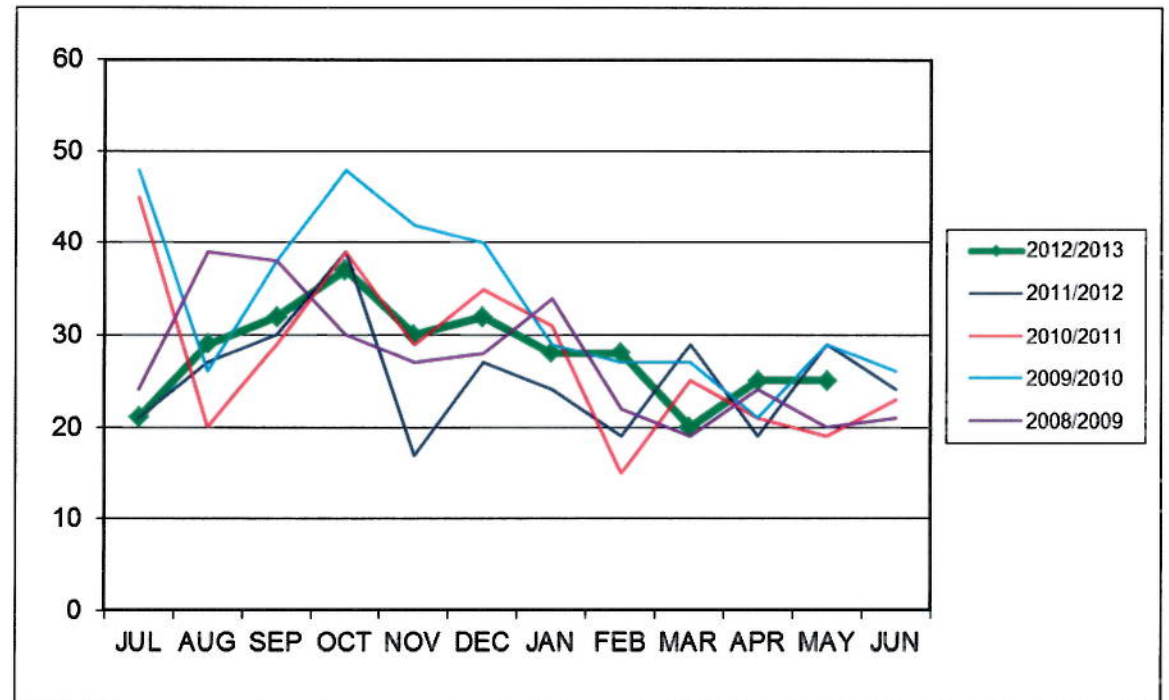
Chair Miyashiro thanked the Board for their comments and discussion and encourages the dialogue.

ITEM FOR INFORMATION NO. 3

WATER MAIN REPAIR REPORT for May 2013

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Total
2012/2013	21	29	32	37	30	32	28	28	20	25	25		307
2011/2012	21	27	30	39	17	27	24	19	29	19	29	24	305
2010/2011	45	20	29	39	29	35	31	15	25	21	19	23	331
2009/2010	48	26	38	48	42	40	29	27	27	21	29	26	401
2008/2009	24	39	38	30	27	28	34	22	19	24	20	21	326

<u>Date</u>	<u>Address</u>	<u>Size</u>
5/2	2026 Aamanu St.	8" C.I.
5/2	250 Kaiolohia Pl.	8" D.I.
5/2	905 Kokea St.	12" C.I.
5/3	2240 Auhuhu St.	8" C.I.
5/6	1003 Auloa Rd.	12" C.I.
5/7	4607 Sierra Dr.	6" C.I.
5/8	1091 Keolu Dr.	12" C.I.
5/9	99-713 Pohue St.	8" C.I.
5/9	1322 Lunalilo Home Rd.	8" D.I.
5/9	1229 Kuuna St.	4" C.I.
5/9	99-922 Hulumanu St.	8" C.I.
5/9	McCully St. & Kapiolani Bl.	16" C.I.
5/9	2160 Aumakua St.	8" C.I.
5/10	94-047 Waipahu Depot St.	6" C.I.
5/11	1318 Lunalilo Home Rd.	8" D.I.
5/19	229 Kaiolohia Pl.	8" D.I.
5/20	603 22nd Av.	12" C.I.



5/20	808 Kahena Pl.	4" C.I.
5/22	919 Alewa Dr.	8" P.V.C.
5/22	1357 Halekoa Dr.	6" C.I.
5/22	1222 Kainui Dr.	12" C.I.
5/24	245 Kaiolohia Pl	8" D.I.
5/25	1045 Matzie Ln.	8" D.I.
5/30	98-1613 Hoomaika St.	12" D.I.
5/31	327 Keawe St.	8" D.I.

Bold * - Pro-active Leak
Repair

20 miles of pipelines were surveyed by the Leak Detection Team
in the month of May

DISCUSSION: There were no comments or discussion.

ITEM FOR INFORMATION NO. 4

"June 24, 2013

GROUNDWATER
LEVELS

Chairman and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chairman and Members:

Subject: Status Update of Groundwater Levels at All Index
Stations

There are three aquifer index wells within low groundwater status for the production week that ended on June 8, 2013. Kaimuki is in an alert status, and Kaluanui and Punaluu are under a caution status. The weekly production average for the period was 137.78 million gallons per day.

The Board of Water Supply rainfall index for the month of May was 172 percent of normal, with a 5-month moving average of 118 percent. As of June 4, 2013, the U. S. Drought Monitor site reports no drought condition on the island of O'ahu. The National Weather Service is forecasting below normal precipitation amounts through November 2013. Head level declines are following a normal seasonal trend.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachments"

The foregoing was for information only.

DISCUSSION: There were no comments or discussion.

PUMPAGE, HEAD, AND RAINFALL REPORT

Week of 6/02/13 to 6/08/13

STATION	MGD	HEAD	STATION	MGD	HEAD	STATION	MGD	HEAD	PH (CONT)	MGD	HEAD
METRO			WINDWARD			EWA-WAIAANAE (CONT)					
KULIOUOU	0.00					MAKAHA IV	0.00		PEARL CITY II	1.06	
WAILUPE	0.00		WAIMANALO II	0.41		MAKAHA V	0.59		PEARL CITY III	0.39	
WAIALAE-IKI	0.00		WAIMANALO III	0.27		MAKAHA VI	0.00		WAI AU	1.65	
AINA KOA	0.50		KUOU I	0.00		MAKAHA SHAFT	0.11	9.17	NEWTOWN	1.36	
AINA KOA II	0.68		KUOU II	0.07		KAMAILE	0.00		KAONOH I	0.84	
WAIALAE SHAFT	0.00		KUOU III	0.27		WAIAANAE I	0.09		WAIMALU I	0.00	
MANOA II	1.06		LULUKU I	1.06		WAIAANAE II	0.67		AIEA	0.00	
PALOLO	1.10		HAIKU	0.30		WAIAANAE III	0.00		AIEA GULCH 497	0.44	
KAIMUKI HIGH	2.61	22.36	IOLEKAA	0.12		MAKAKILO	0.31		AIEA GULCH 550	0.24	
KAIMUKI LOW	0.53		KAHALUU	0.49		HONOULIULI I	0.60		HALAWA 277	0.51	
WILDER	9.89		WAIHEE	0.00		HONOULIULI II	6.91		HALAWA 550	0.00	
BERETANIA HIGH	4.66	22.50	KAHANA	0.00		SUBTOTAL:	10.69		KAAHUMANU MTR(-)	0.00	
BERETANIA LOW	1.78		PUNALUU I	0.00	16.09	IMPORT FROM PH			KAAMILO FLO MTR (-)	0.00	
KALIH I HIGH	0.22	22.09	PUNALUU II	2.59		KAPOLEI LINE BSTR	15.05		KUNIA I	5.08	18.62
KALIH I LOW	1.23		PUNALUU III	1.44		HONOULIULI LB FLOW	0.00		KUNIA II	1.99	
KAPALAMA	1.48		KALUANUI	1.31		EWA BEACH FLOW	0.00		KUNIA III	1.37	
KALIH I SHAFT	8.24		MAAKUA	0.75		HONOULIULI I (-)	-0.60		HOAEAE	6.40	
MOANALUA	1.48	18.97	HAUULA	0.16		HONOULIULI II (-)	-6.91		EWA SHAFT	0.00	
SUBTOTAL:	35.45					SUBTOTAL:	7.55		WAI PAHU INTCON. (-)	-2.27	
			KAHUKU	0.36					EWA-WAIAANAE (-)	-7.55	
IMPORT FROM PH			OPANA	1.04		PEARL HARBOR			PH LOCAL USE:	30.33	
HALAWA SHAFT	7.25	16.53	WAI ALEE I	0.05		WAIHAWA	2.83		TOTAL SUBURBAN:	61.24	
KAAMILO	0.00		WAI ALEE II	0.26		WAIHAWA II	0.00				
KALAU AO	8.92	16.96	SUNSET BEACH	0.00		MILILANI I	2.56		KALAU AO SPRINGS	0.69	
PUNANANI	11.65		SUBTOTAL:	10.94		MILILANI II	0.00		BARBERS POINT (NP)	1.04	
KAONOH I II	0.00					MILILANI III	0.81		GLOVER TUNNEL (NP)	0.54	
WAIMALU II	0.00	14.97	WIND. EXPORT	0.50		MILILANI IV	1.71				
KAAHUMANU	0.95					WAIPIO HTS.	0.16		HEAD CONDITION		
HECO WAI AU	2.69		HALEIWA-WAI ALUA			WAIPIO HTS. I	0.09		CAUTION	ALERT	CRITICAL
MANANA	0.01		HALEIWA	0.00		WAIPIO HTS. II	0.34		Kaluanui	Kaimuki	
KAAHUMANU FLOW MT	0.00		WAI ALUA	2.23		WAIPIO HTS. III	1.16		Punaluu		
KAAMILO FLOW MTR	0.00		SUBTOTAL:	2.23		WAI PAHU	2.27	18.33			
TOTAL IMP/EXP WAI P. INT:	2.27					WAI PAHU II	0.79				
IMPORT FRM WIND:	0.50		EWA-WAIAANAE			WAI PAHU III	2.19				
SUBTOTAL:	34.24		MAKAHA I	0.28		WAI PAHU IV	3.39				
			MAKAHA II	0.13		PEARL CITY SHAFT	0.00	14.73			
TOTAL METRO:	69.69		MAKAHA III	1.01		PEARL CITY I	0.52				

CWRM PERMITTED USE FOR BWS POTABLE SOURCES						PUMPAGE	2013	2012	GRAVITY	2013	2012
	A	B	C	D	E	SUBURB.	61.24	65.94	SUBURB.	6.46	9.13
WATER DISTRICTS	PERMITTED USE	2013	DIFF. B-A	YEAR/ DATE	DIFF. D-A	METRO	69.69	71.43	METRO	0.39	0.37
						TOTAL:	130.93	137.37	TOTAL:	6.85	9.50
HONOLULU	45.27	35.84	-9.42						Manoa	0.17	
WINDWARD	25.21	13.99	-11.22			NUUANU #5			Palolo	0.22	
NORTH SHORE	4.08	3.94	-0.14			(rainfall)	1.98"	0.28"	Waim. I&II	0.23	
WAIHAWA	4.27	2.83	-1.44						Waim. III&IV	0.19	
WAIAANAE	4.34	3.41	-0.93						Waihee incl.	0.99	
EWA-KUNIA	15.88	7.81	-8.07						Waihee tun.	1.59	
PEARL HARBOR	92.66	68.79	-23.87						Luluku	0.13	
TOTAL:	191.71	136.61	-55.10						Haiku	0.00	
									Kahaluu	1.79	
									Waia. C&C	1.37	
									Waia plant.	0.17	

DROUGHT STATUS REPORT
DRAFT IN MGD

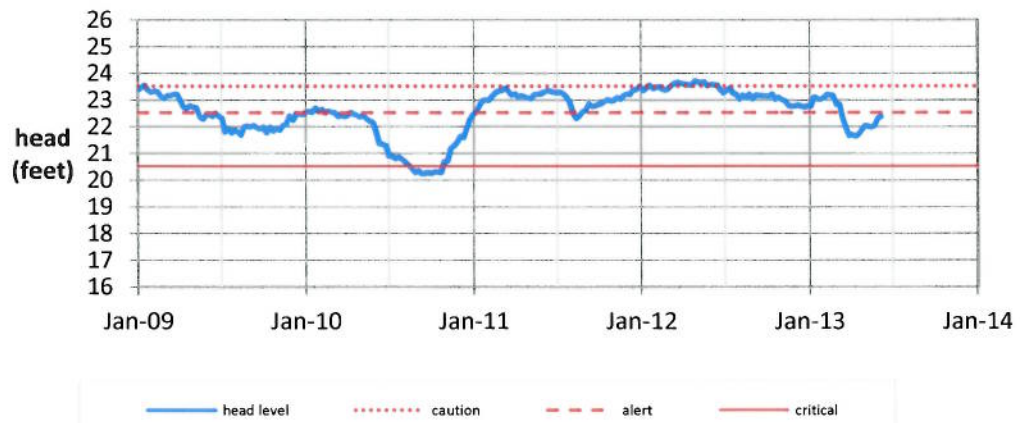
WATER USE DISTRICT	AUTHORIZED USE	2012	5/19-5/25 2013	2012	5/26-6/01 2013	2012	6/02-6/08 2013		
HONOLULU	45.27	32.25	35.70	31.76	36.34	32.31	36.34		
WINDWARD	25.21	20.33	12.33	20.27	13.65	16.62	13.65		
NORTH SHORE	4.08	3.84	4.00	3.84	3.94	4.00	3.94		
WAHIAWA	4.27	3.10	2.88	3.06	2.83	3.07	2.83		
EWA-WAIANAE	20.22	25.11	22.24	26.61	19.78	25.59	19.78		
PEARL HARBOR	92.66	63.03	54.89	61.73	61.24	65.27	61.24		
TOTAL	191.71	147.66	132.05	147.28	137.78	146.86	137.78		

Accounts for in-district pumpage and transfers

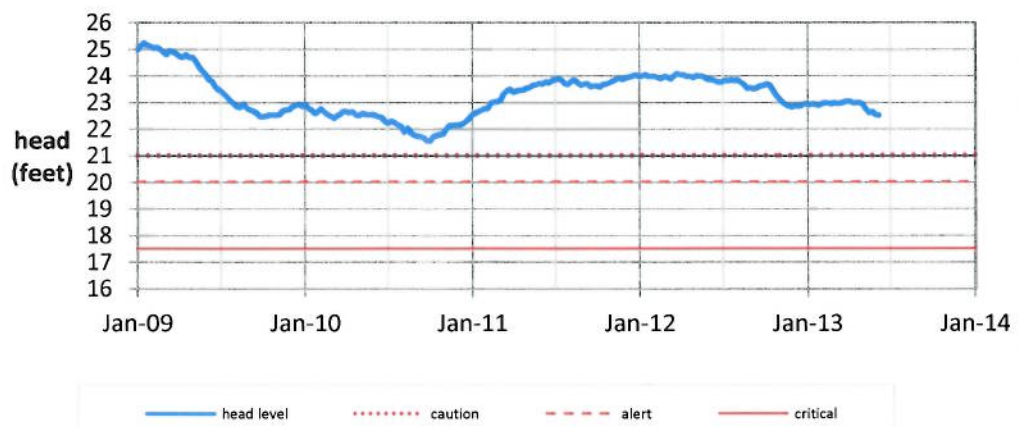
HEAD IN FEET

		2012	5/19-5/25 2013	2012	5/26-6/01 2013	2012	6/02-6/08 2013		
HONOLULU									
KAIMUKI		23.51	22.01	23.56	22.36	23.54	22.36		
BERETANIA		23.88	22.64	23.85	22.50	23.83	22.50		
KALIHI		22.85	22.14	22.84	22.09	22.80	22.09		
MOANALUA		19.03	18.97	19.01	18.97	18.96	18.97		
PEARL HARBOR									
HALAWA		16.49	16.51	16.46	16.53	16.42	16.53		
KALAUAO		17.22	17.01	17.20	16.96	17.18	16.96		
PEARL CITY		14.98	14.79	14.97	14.73	14.95	14.73		
WAIPAHU		18.59	18.37	18.57	18.33	18.54	18.33		
KUNIA		19.02	18.73	18.99	18.62	18.96	18.62		
EWA-WAIANAE									
MAKAHA		11.34	9.59	10.70	9.17	10.55	9.17		
WINDWARD									
PUNALUU		15.89	16.02	15.73	16.09	15.77	16.09		
KALUANUI		16.03	15.87	15.81	15.87	15.67	15.97		
NORTH SHORE									
WAIALUA		11.07	11.14	11.05	11.15	11.06	11.18		

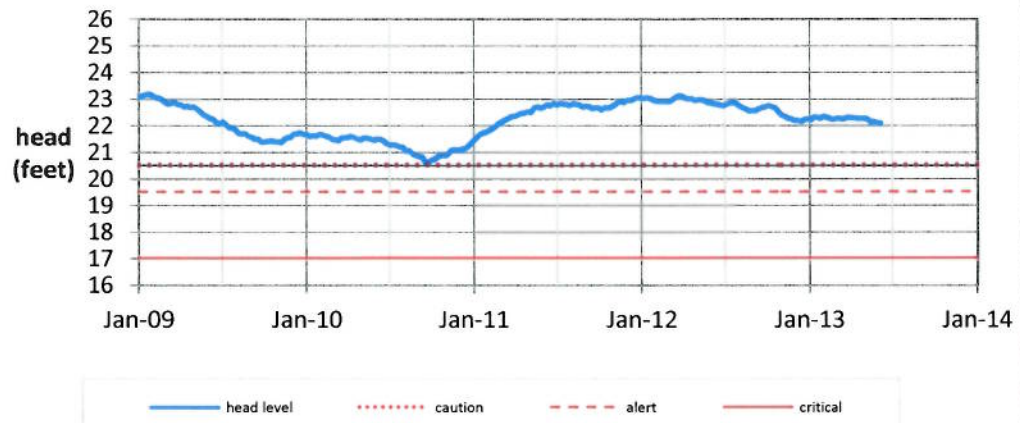
Kaimuki



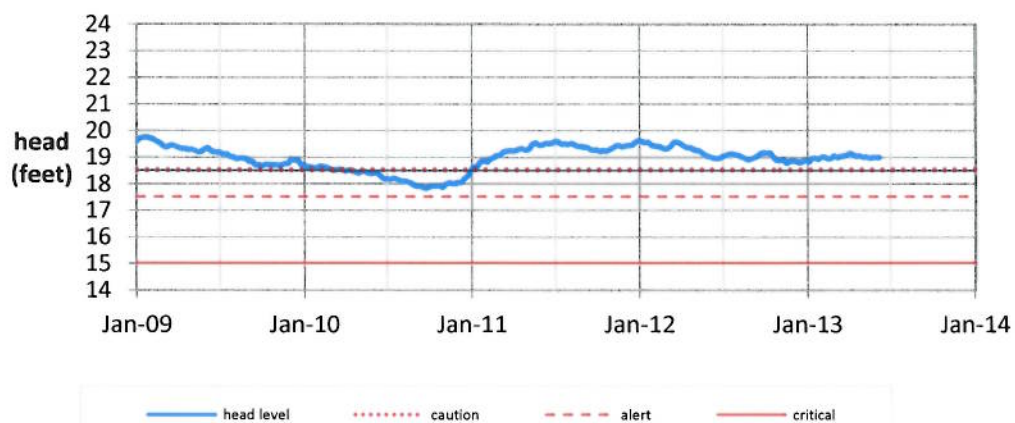
Beretania



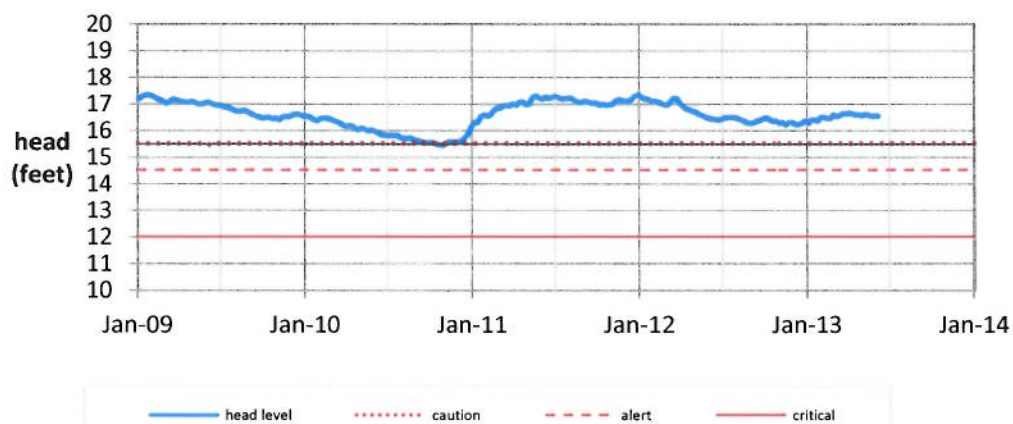
Kalihi



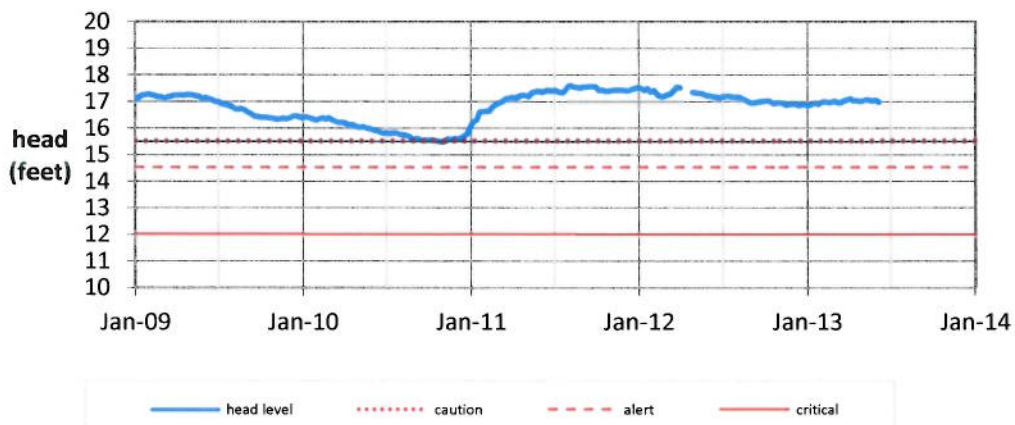
Moanalua



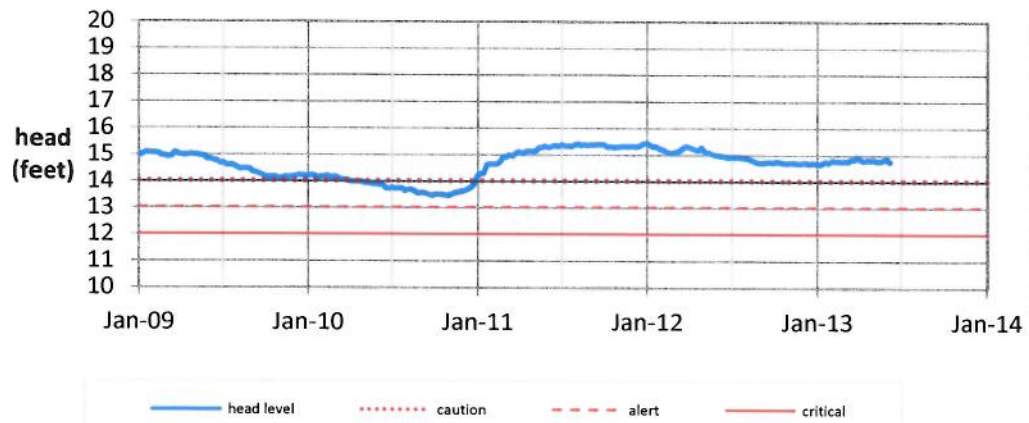
Halawa



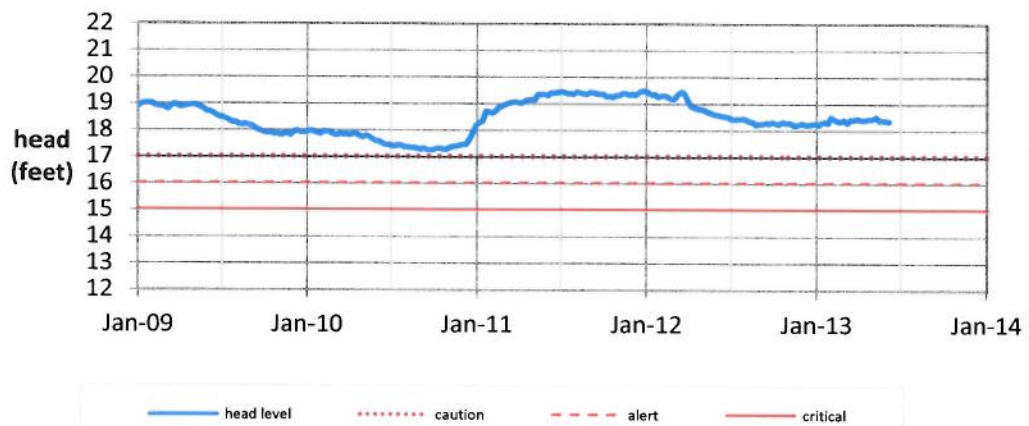
Kalauao



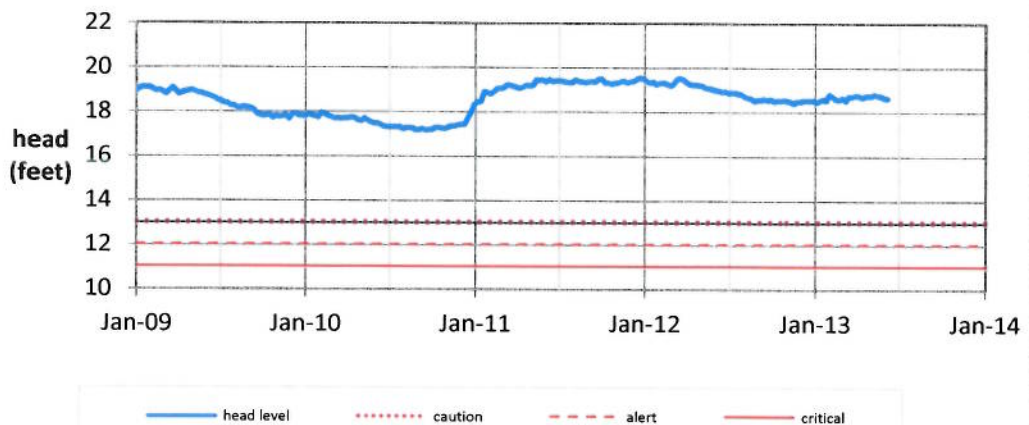
Pearl City



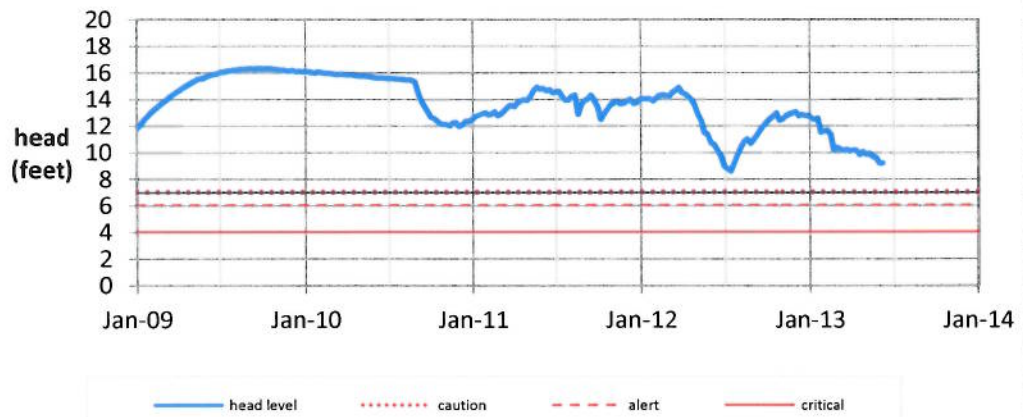
Waipahu



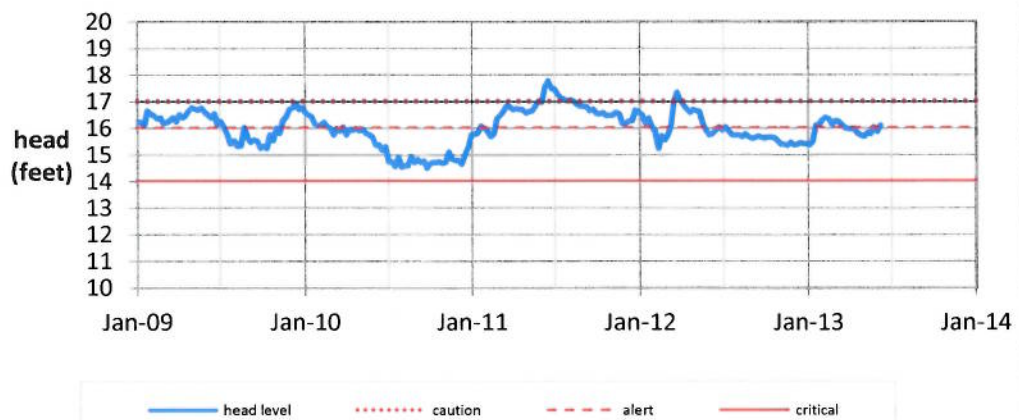
Hoeaee-Kunia



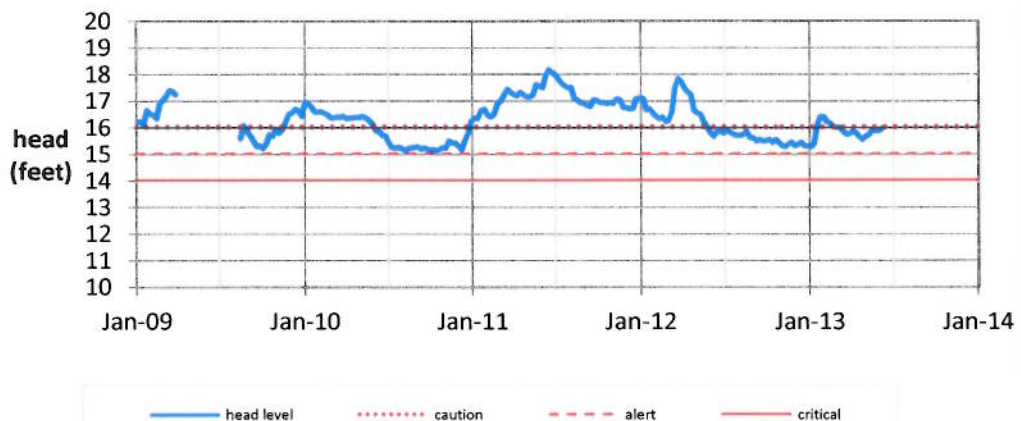
Makaha



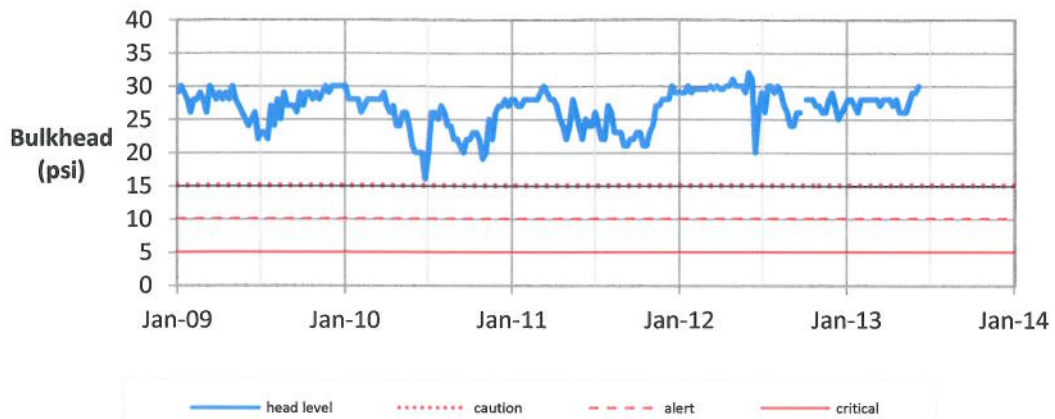
Punaluu



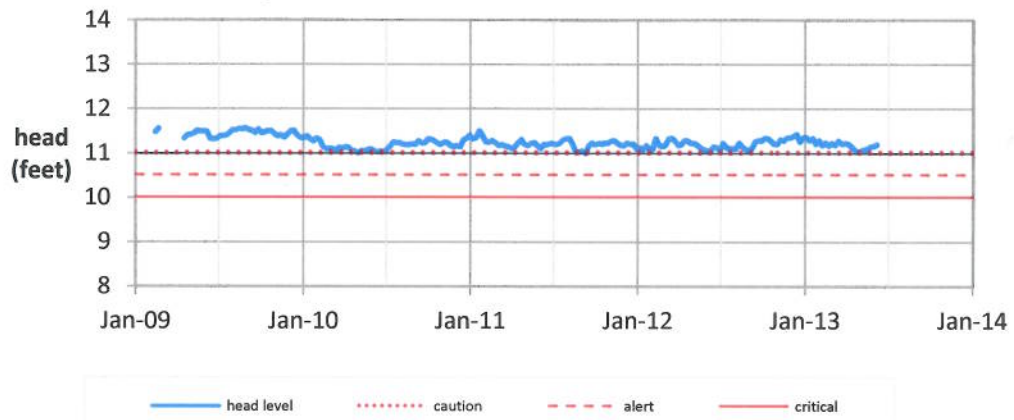
Kaluanui

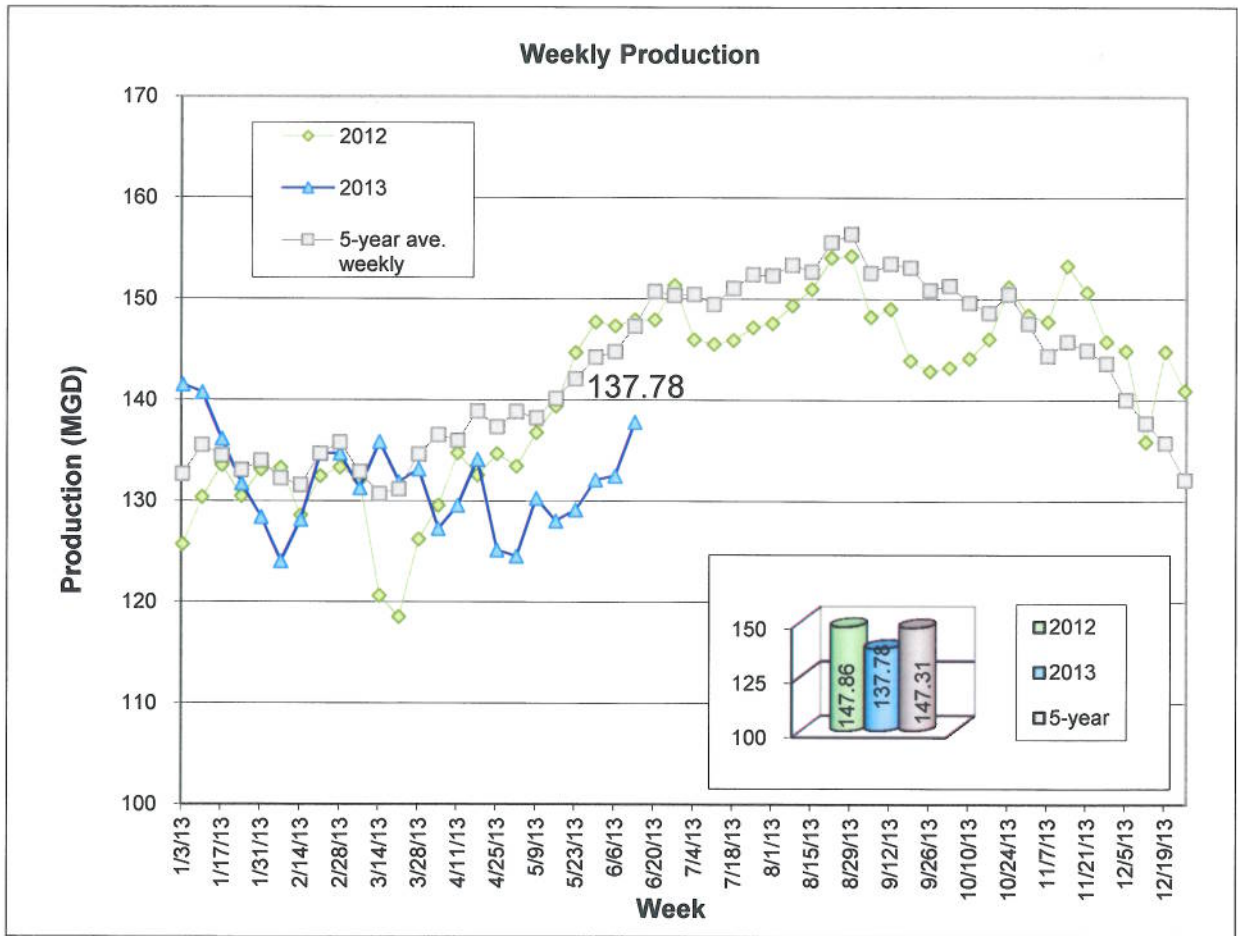
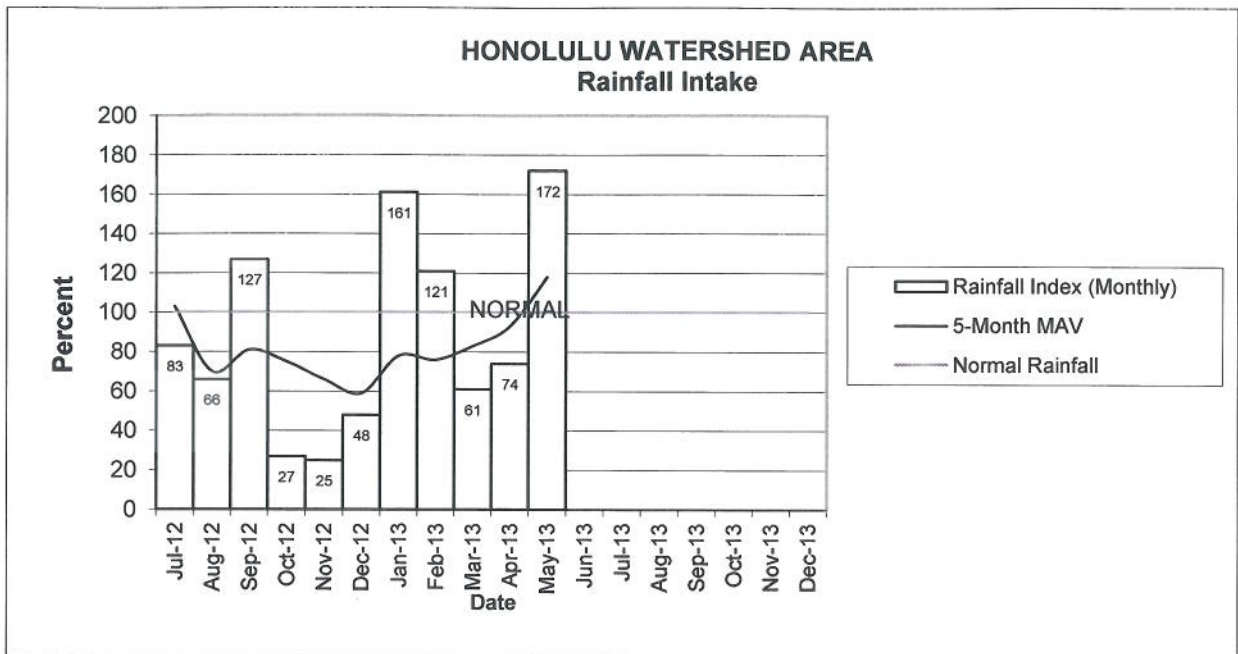


Waihee Tunnel



Waialua





ITEM FOR INFORMATION NO. 5

"June 24, 2013

WATER
RESOURCES
BRIEFING

Chairman and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chairman and Members:

Subject: Water Resources Briefing

Water Resources staff will provide an overview of Oahu's water resources; the Oahu Water Management Plan of watershed protection and water use and development; and the Low Groundwater Plan of resource monitoring and mitigating water shortages during intense drought.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer"

The foregoing was for information only.

DISCUSSION:

Water Resources Program Administrator Barry Usagawa did a presentation on Oahu's Water Resources, Oahu Water Management Plan, and Low Groundwater Plan.

Mr. Usagawa highlighted the 2009 status of Oahu's aquifer sustainable yields, State permitted uses for groundwater sources, and actual groundwater use. Mr. Wong inquired if the BWS has a metric that is used to determine how much water is used per capita in conjunction with population or development growth. Mr. Usagawa responded that for planning purposes, they use 180 gallons per day per person. Ms. McMurdo asked if the Hoopili development was included in the 147 million gallons of permitted use that was shown for the Pearl Harbor aquifer. Mr. Usagawa acknowledged that most of Ewa's future growth including Hoopili is included in the Ewa Shaft allocation. Ms. McMurdo also asked if the Koa Ridge development will be getting water from the Central aquifer and Mr. Usagawa confirmed that it would be.

Mr. Usagawa showed the historical reduction of water use as a result of BWS's conservation efforts. Mr. Lau highlighted that demand is back to what it was in the 1970's, which is amazing given the fact that the city has grown in both population and development. Ms. Cypher commented that the BWS's success in water management was, in part, due to a better conservation program and also a reduction of water use because of the higher water rates.

Mr. Usagawa explained the water source capacity and the projected demands in the Ewa district. Mr. Miyashiro questioned if desalination technology is similar to consumer electronics, where it improves and costs come down over time. Mr. Usagawa stated that desalination energy recovery, control systems and membrane life technology will continue to improve. Mr. Miyashiro mentioned that according to the graph, desalination is going to be needed in 2020, which is seven years out. Mr. Usagawa pointed out that conservation in Ewa appears to be pushing the growth projections out a few more years than previously projected. BWS is planning a desalination post treatment study in the next couple of years to ensure desalinated water will blend well in the existing Campbell Industrial Park water system. Ms. McMurdo inquired if the Pural system was included in the graph and Mr. Usagawa responded no, the Pural contract to own and operate the Navy's Kalaheo water system, is separate from the BWS system.

Mr. Usagawa informed the Board that they are working with the University of Hawaii and the U.S. Geological Survey to study the possible impacts of climate change to the watershed. Mr. Sasamura stated that he noticed a lot of wells showed zero flows and questioned if that meant that they weren't being used. Mr. Usagawa confirmed that and said that because water demand has decreased, they can rest some of their sources.

Mr. Usagawa explained the status of each of the eight regions of the Oahu Watershed Management Plan and the plan components. Ms. McMurdo inquired if each district was just using water resources from within their district. Mr. Usagawa replied that some districts have enough water to meet their demands but others do not, and therefore water is transferred between districts. Each regional plan tries to determine all water uses within the district (urban, agriculture, traditional/cultural rights and resource conservation water needs) before evaluating transfers of water to neighboring districts. Mr. Wong inquired about balancing water needs and if that dictates whether land development occurs within the district or if it could be directed elsewhere. Mr. Lau and Mr. Usagawa responded by saying that the BWS supports the development plans of the city and that directive growth is a function managed by the Department of Planning and Permitting. Mr. Wong asked if in-fill development or new subdivisions would use less water. Mr. Usagawa responded that in-fill development uses less water because as building density increases, water use per person goes down. Expanding development horizontally, as in subdivisions, increases irrigation demand. Mr. Lau added that infrastructure costs are less for in-fill developments.

Ms. McMurdo requested clarification on the cost of desalination being equal to the cost of building more transmission lines. Mr. Usagawa explained that operating and maintaining a desalination plant is energy intensive because of the 900 psi pressures it takes to filter seawater. But when compared to developing a source on the North Shore, installing a transmission line 17 miles long, installing reservoirs and booster pump stations to pump the water up over Wahiawa to Ewa, the overall capital cost is about equal. Desalinated water will be of very high quality, as the same reverse osmosis demineralization technology is used to purify bottled water. The BWS presently has two sites for

the development of desalination plants; one in Kapolei Business Park (brackish desal plant) and the other in Campbell Industrial Park (seawater desal plant).

Mr. Wong thanked Mr. Usagawa for the presentation and commented that this kind of long-term thinking should also be applied to a Human Resources and Communications plan. Mr. Lau stated that they are in the process of developing these two plans.



BWS Mission



Water for Life
Safe and Dependable Water





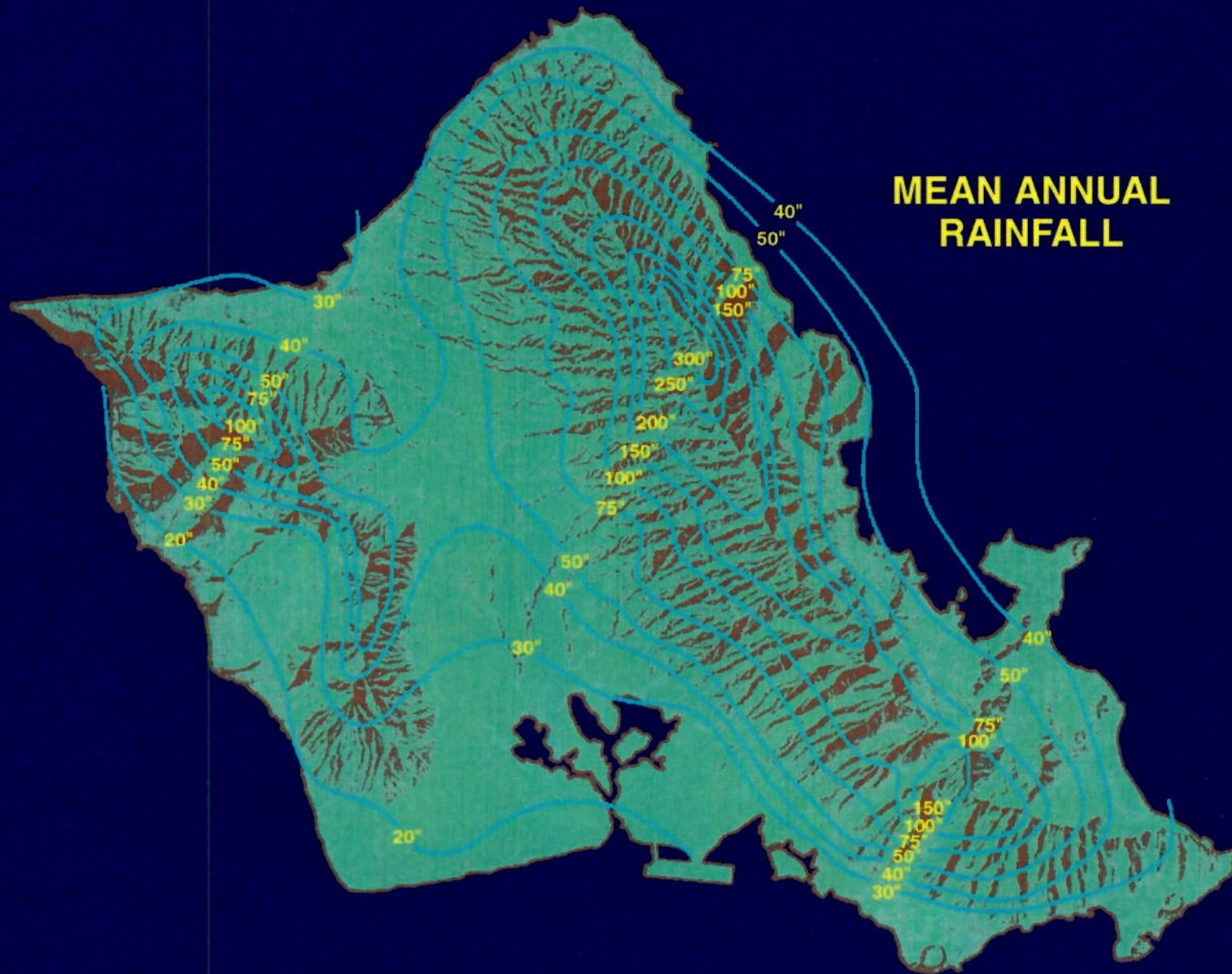
Presentation Outline

- Oahu's Water Resources
- Oahu Water Management Plan
- Low Groundwater Plan

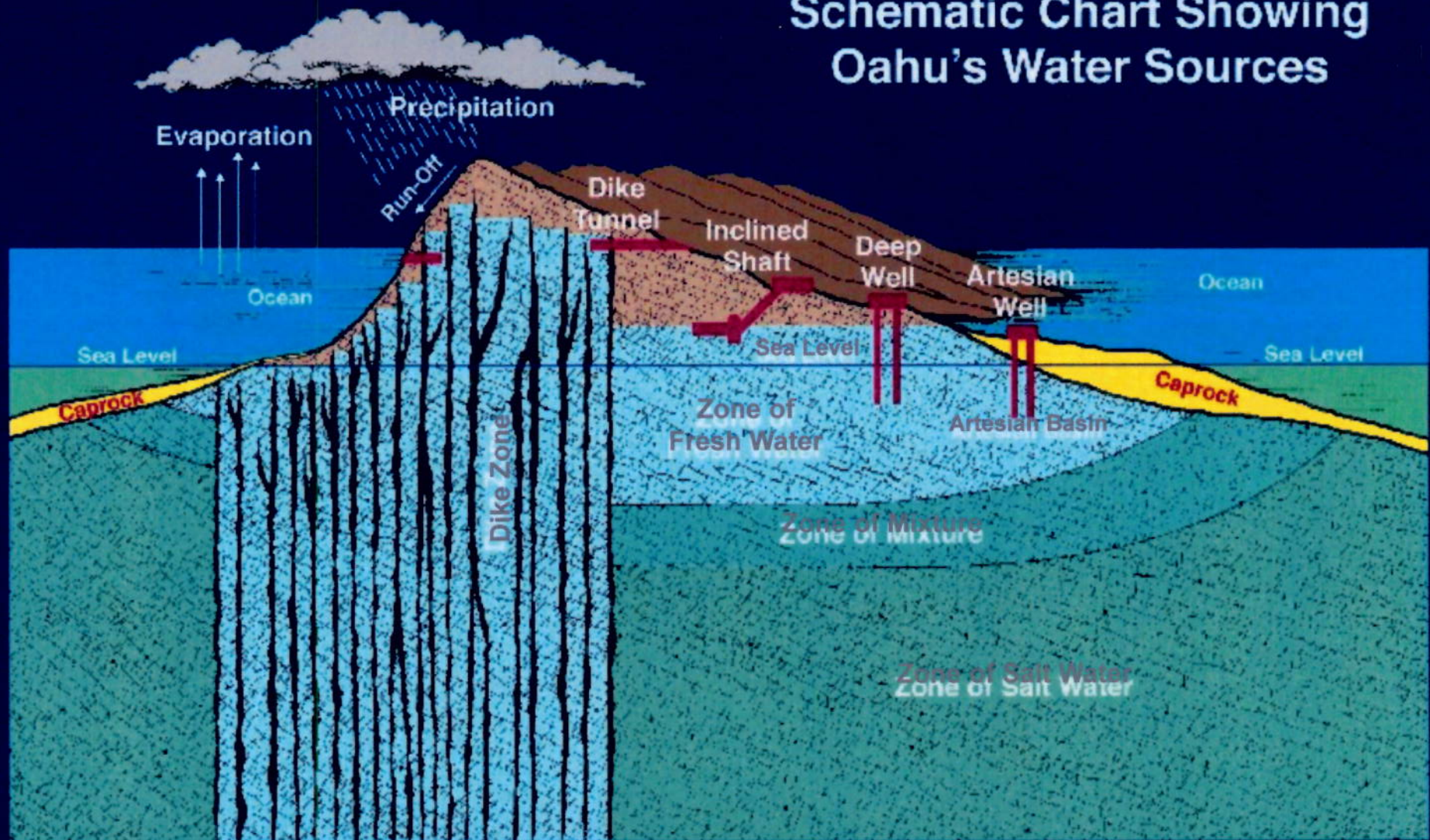




Oahu's Water Resources



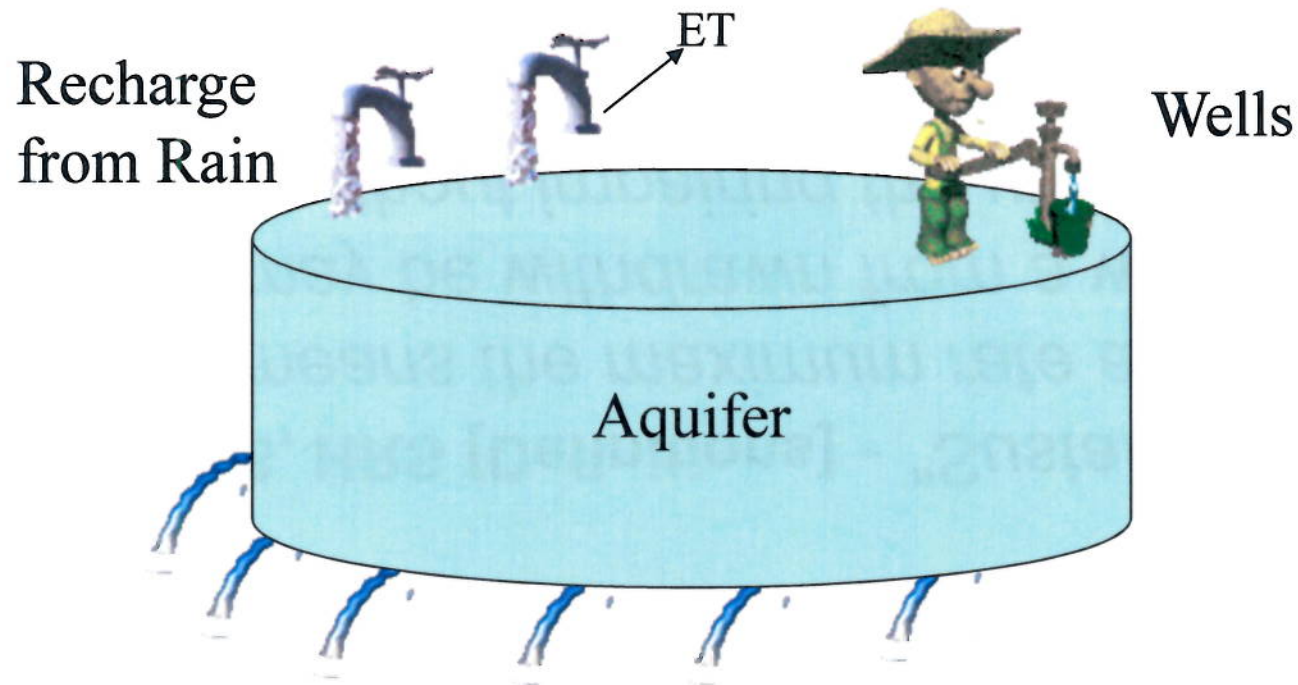
Schematic Chart Showing Oahu's Water Sources



GROUNDWATER BODIES



Groundwater is a Renewable Resource



Leakage to the Streams and Near Shore Waters

Sustainable only if Well Pumpage < Recharge - Leakage



Ground Water Sustainable Yield

- Definition of Sustainable Yield (SY)
 - **§174C-3, HRS [Definitions]** - *"Sustainable yield" means the maximum rate at which water may be withdrawn from a water source without impairing the utility or quality of the water source as determined by the commission.*

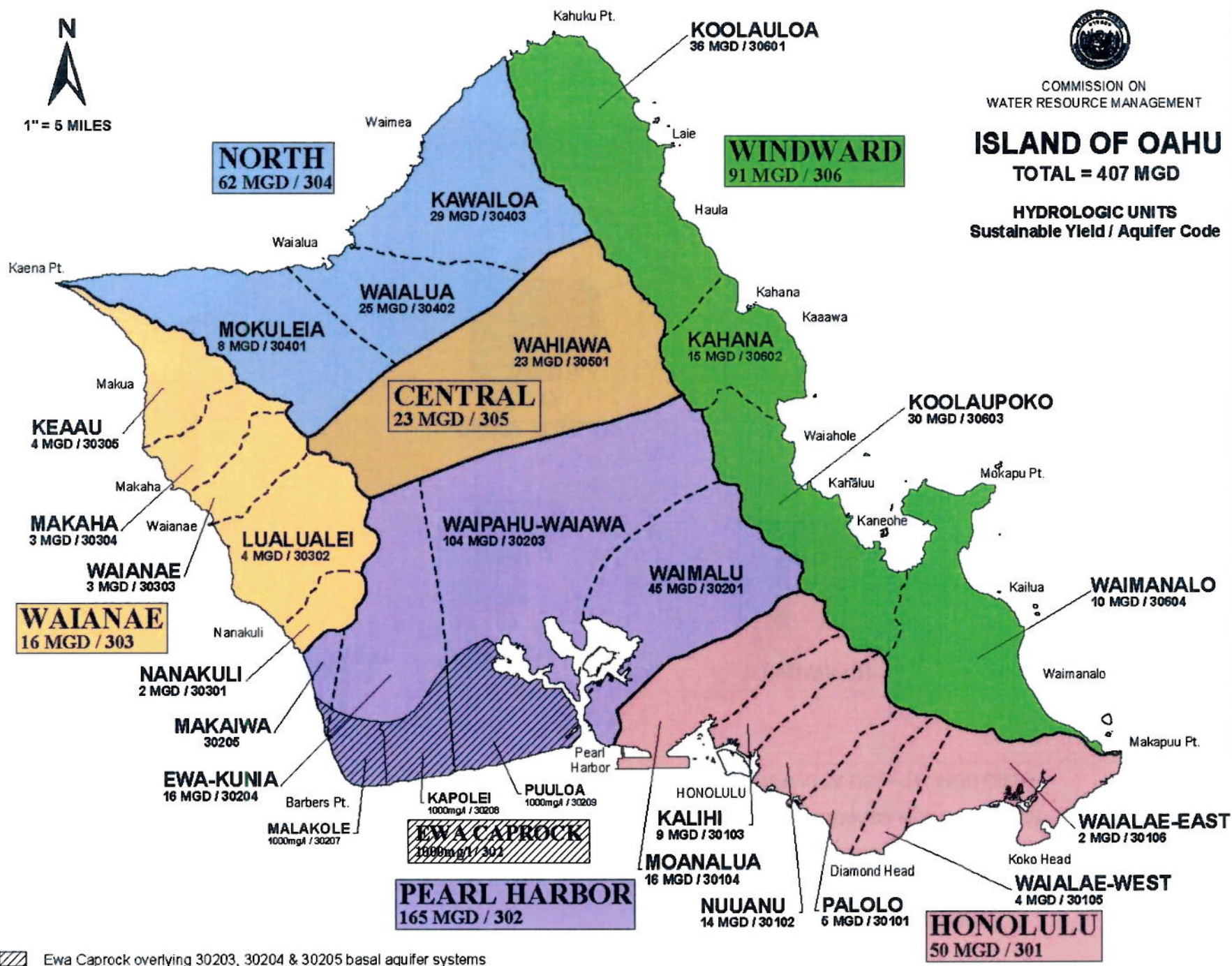




TOTAL = 407 MGD

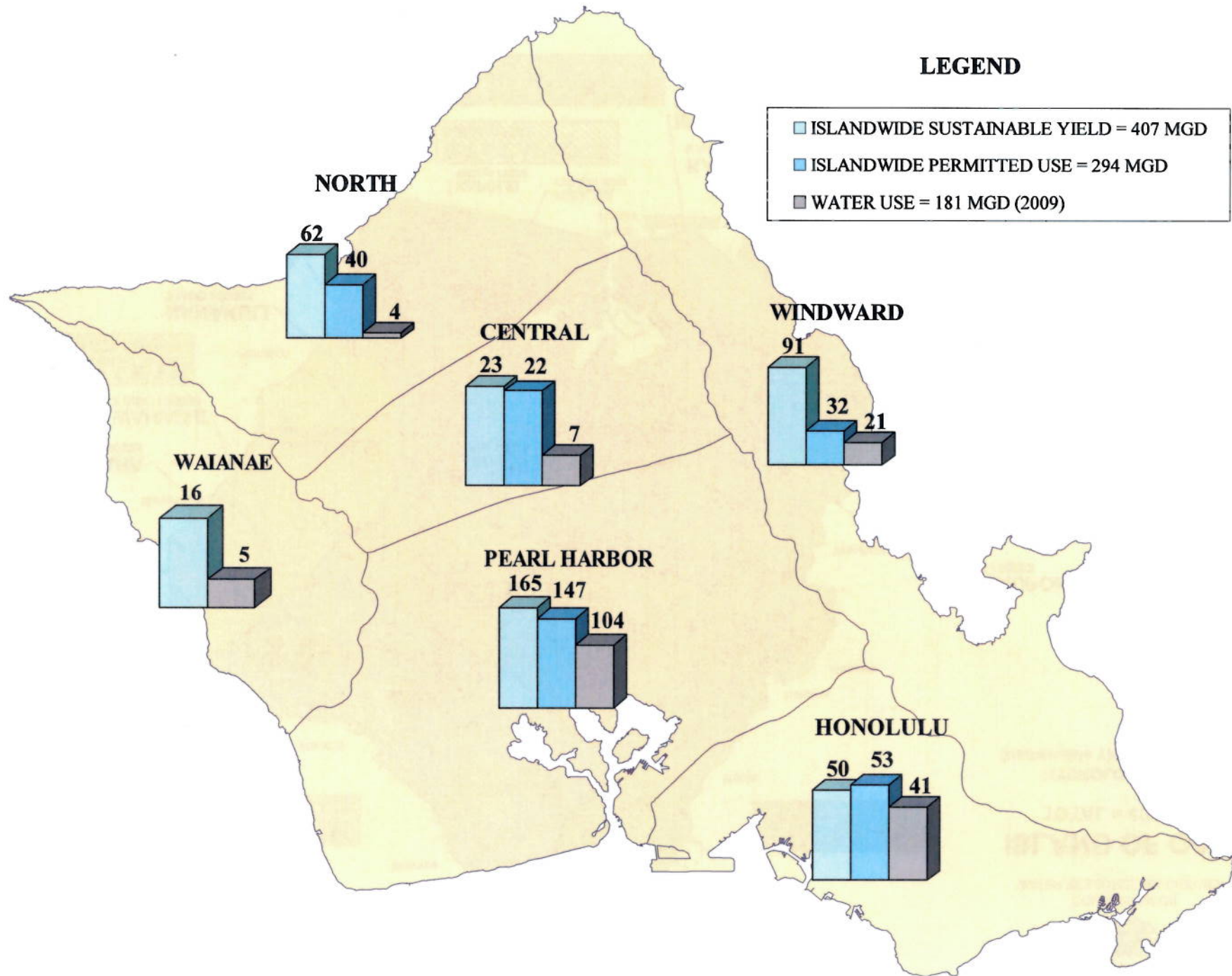
HYDROLOGIC UNITS

Sustainable Yield / Aquifer Code



LEGEND

- ISLANDWIDE SUSTAINABLE YIELD = 407 MGD
- ISLANDWIDE PERMITTED USE = 294 MGD
- WATER USE = 181 MGD (2009)





Oahu Sustainable Yield and Ground Water Use

Aquifer Sector	Sustain-able Yield (SY)	Water Use Permits Issued (2009)	Un-allocated SY	Existing Water Use (12 MAV), Sep 2009	SY minus Water Use
Honolulu	50	53.119	-3.119	41.169	8.831
Pearl Harbor	165	147.264	17.736	103.987	61.013
Central	23	21.928	1.072	7.047	15.953
Wai'anae	16	0.000	16.000	4.795	11.205
North	62	39.590	22.050	3.533	58.467
Windward	91	31.633	59.367	20.580	70.420
TOTAL AQUIFER SECTOR	407	293.894	113.106	181.111	225.889
Ewa Caprock		15.897		6.448	
Waiāhole Ditch	15	12.440	2.560	8.524	6.476
GRAND TOTAL FRESH & BRACKISH	442	322.231	115.666	196.083	232.365

Groundwater by Water Use Category

Use Category	Water Use 12-Mo. MAV Sept 2009 (mgd)	Percentage of Total Water Use Sept 2009
Municipal	148	76%
Military	22	11%
Agriculture*	14	7%
Irrigation**	5	3%
Domestic	2	1%
Industrial**	4	2%
Total	196	100%

* Includes Waiahole Ditch

** Includes Ewa Caprock Brackish aquifer



Oahu Population Summary

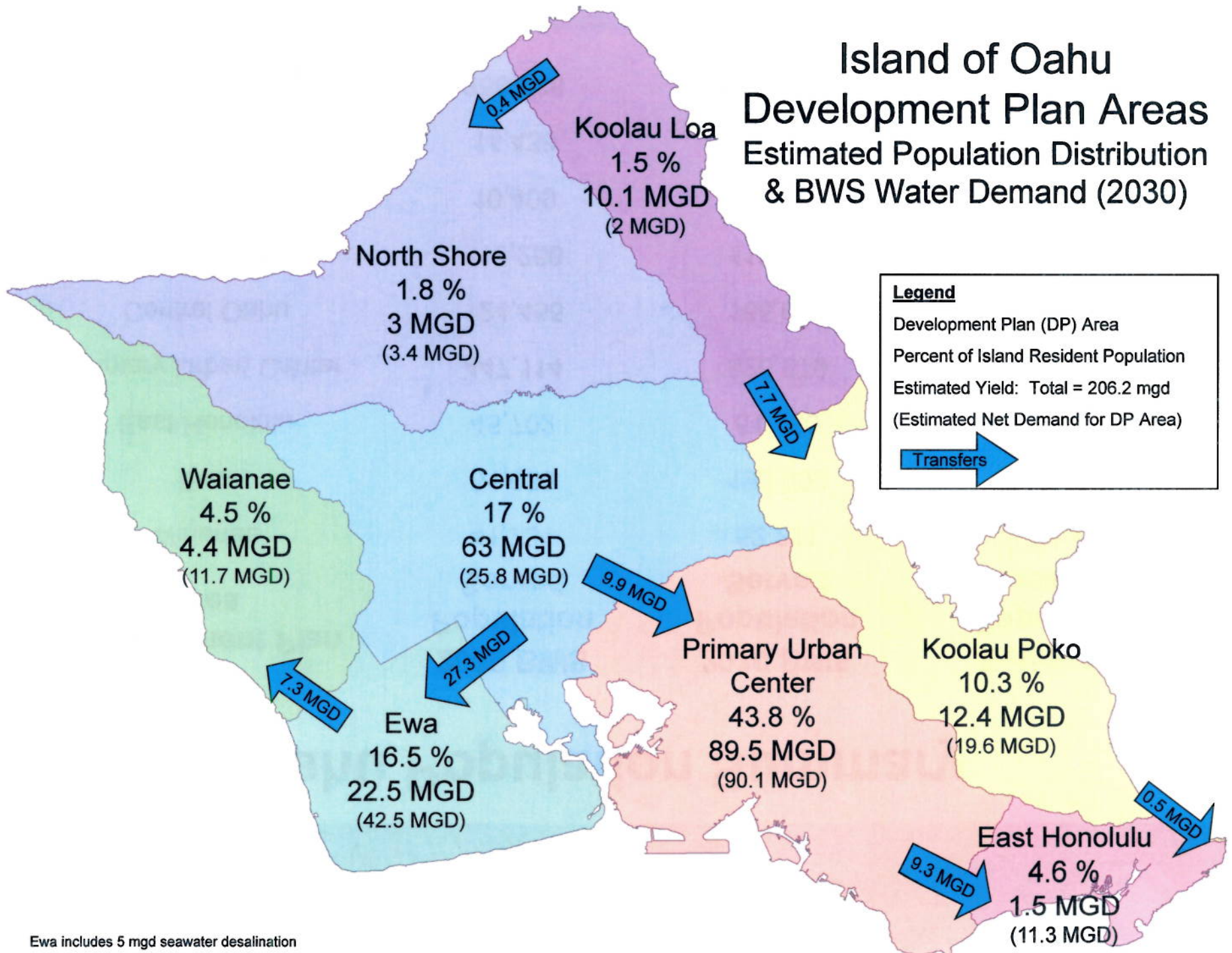
Development Plan Area	2000 BWS Population Served	2030 BWS Population Served	Estimated Population Increase in 2030
Waianae	41,731	52,211	10,480
Ewa	61,660	190,099	128,439
East Honolulu	45,702	51,150	5,448
Primary Urban Center	447,114	526,579	79,465
Central Oahu	124,455	165,651	41,196
Koolau Poko	113,256	112,048	-1,208
Koolau Loa	10,409	14,369	3,960
North Shore	14,438	17,174	2,736
Total	858,766	1,129,280	270,514



Island of Oahu

Development Plan Areas

Estimated Population Distribution & BWS Water Demand (2030)



Ewa includes 5 mgd seawater desalination



Board of Water Supply
City and County of Honolulu

Potable Groundwater Sources for Growth

	New Ground Water Sources	Estimated Yield (mgd)	Additional Permitted Use Required (mgd)	CWRM WMA	Potential Development Plan Area(s) Served
1	Kahuku Well No. 3	1	1	Koolauloa	Koolauloa
2	Öpana Wells	1	1	Koolauloa	Koolauloa
3	Kaipapau Well	1		Koolauloa	Koolaupoko
4	Kaluanui Wells	1.5		Koolauloa	Koolaupoko
5	Maakua Wells	1		Koolauloa	Koolaupoko
6	Kuou Well III	0.5		Koolaupoko	Koolaupoko
7	Waimanalo Well III	0.5	0.3	Waimānalo	Koolaupoko
8	Āina Koa Well II	0.7		Waialae-West	East Honolulu
9	Waialae Nui Well	0.7		Waialae-West	East Honolulu
10	Wahiawā Well III	3	3	Wahiawa	Central
11	Waipio Hts Wells II& III	2.5	0.65	Waipahu-Waiawa	Central/PUC
12	Mililani Wells IV	3	1	Waipahu-Waiawa	Central
13	Waiawa Wells I-IV	6	6	Waipahu-Waiawa	Central
14	Manana Well	1	0.9	Waipahu-Waiawa	PUC
15	Kunia Wells III	3		Waipahu-Waiawa	Ewa, Waianae
16	Waipahu Wells II	3	1	Waipahu-Waiawa	Central
17	Waipahu Wells III	3		Waipahu-Waiawa	PUC
18	Waipahu Wells IV	3		Waipahu-Waiawa	Ewa, Waianae
19	Ewa Shaft	10	3	Waipahu-Waiawa	Ewa
20	Koa Ridge Makai Wells	2	2	Waipahu-Waiawa	Central
Total Potable Resources		47.4	19.85 **		



Alternative Potable & Nonpotable Sources

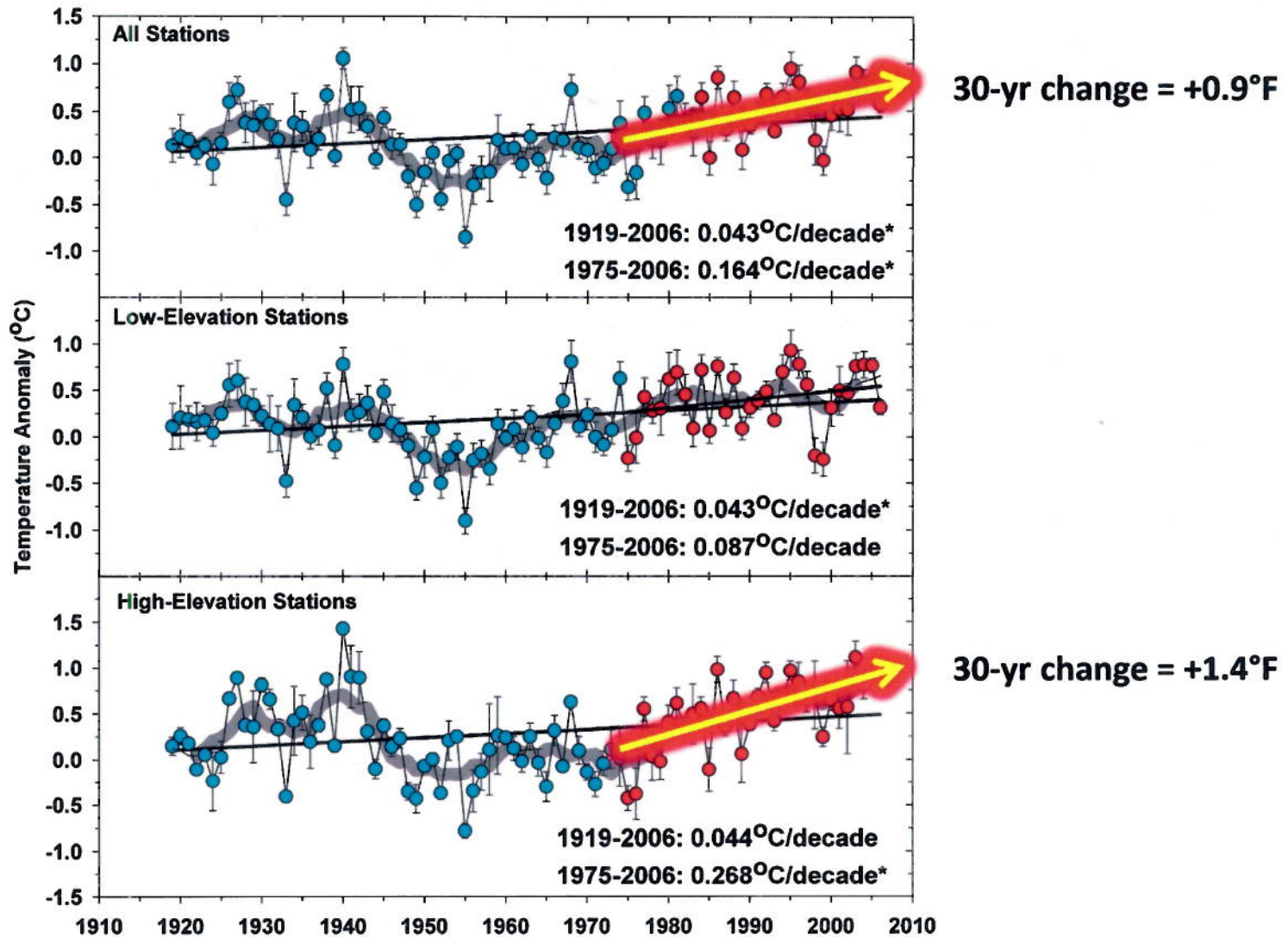
Resource		Minimum Estimate	Maximum Estimate	Development Plan Area(s) Served
Desalination (potable)				
1	Kapolei Brackish Desalination Plant	0.2	0.5	Ewa, Waianae
2	Kalaeloa Seawater Desalination Plant	5	15	Ewa, Waianae
Recycled Water				
4	Wahiawā Recycled Water	2	4	Central
5	Honouliuli Recycled Water	12	20	Ewa
6	Waianae Recycled Water	2	3	Waianae
7	Kahuku, Turtle Bay, Lāie Recycled Water	0.8	2.6	Koolauloa
Nonpotable Water				
8	Waiāhole Ditch	12.57	15	Ewa, Central
9	Wahiawa Reservoir	8.5	22	North Shore, Central
10	Kalauao Spring	0.5	3.3	PUC
11	Kapolei West Brackish Well	1	1	Ewa
12	Koolau Loa Agricultural Wells	6.3	12.6	Koolau Loa
Total Alternative Resources		51.6	98.88	

Pacific Island Climate is Changing

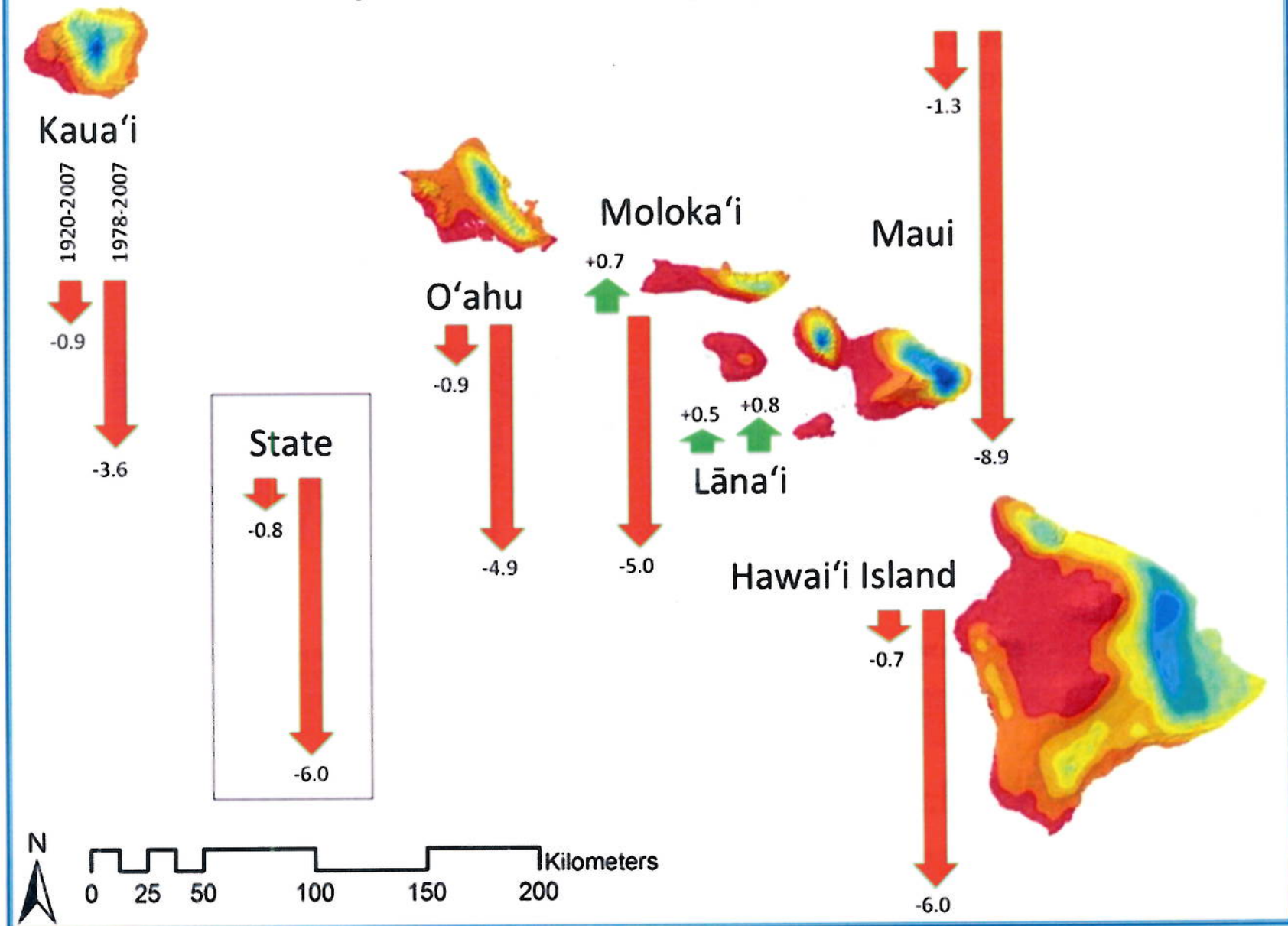
In Hawaii

- Rainfall (-15%) and stream discharge have decreased
- Air temperature is increasing (0.3°F/decade)
- Rainstorm intensity has increased (+12%)
- Drought is expected to intensify
- Sea surface temperature is rising (0.22°F/decade)
- Ocean is more acidic due to increased CO₂
- Sea level is rising causing marine & groundwater inundation

Hawai'i Temperature Index

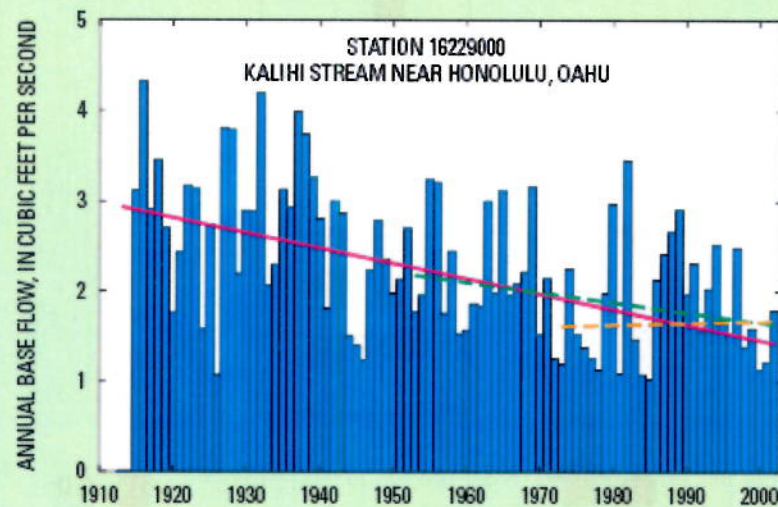


Precipitation Trends (% per decade)

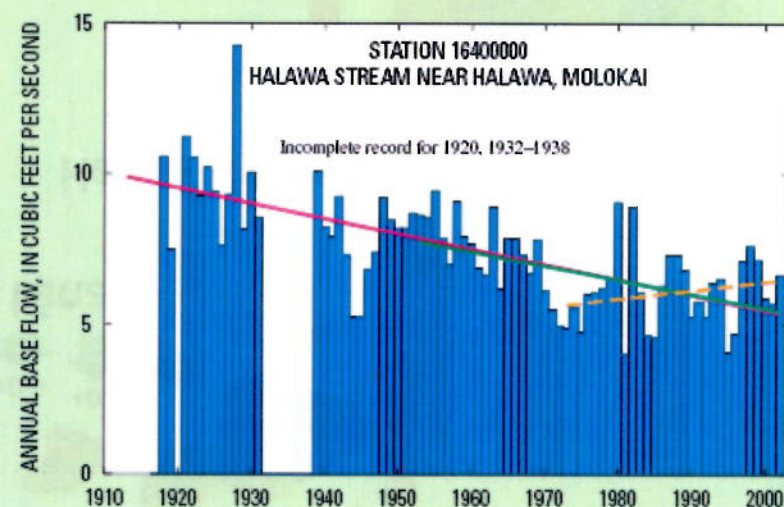


Giambelluca et al. 2011. Regional climate trends in Hawai'i. American Geophysical Union Fall Meeting, Abstract GC21B-0898.

USGS Trends in Annual Mean Base Flow 1913-2002



**TRENDS IN ANNUAL MEAN BASE FLOW
SELECTED LONG-TERM-TREND STATIONS**



EXPLANATION

TREND LINE (KENDALL-THEIL ROBUST LINE)--Dashed line indicates statistically nonsignificant trend

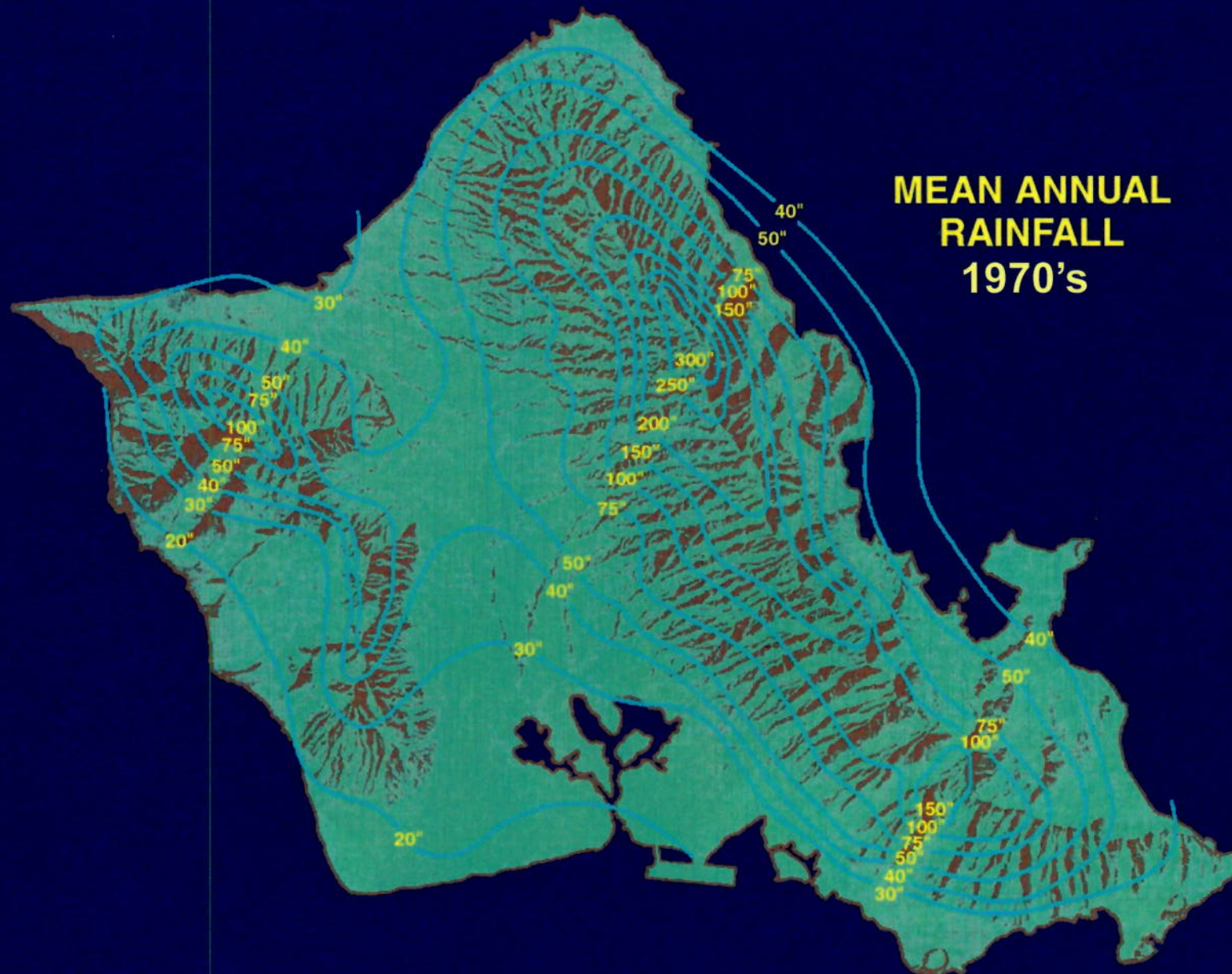
— 1913–2002

— 1953–2002

— 1973–2002

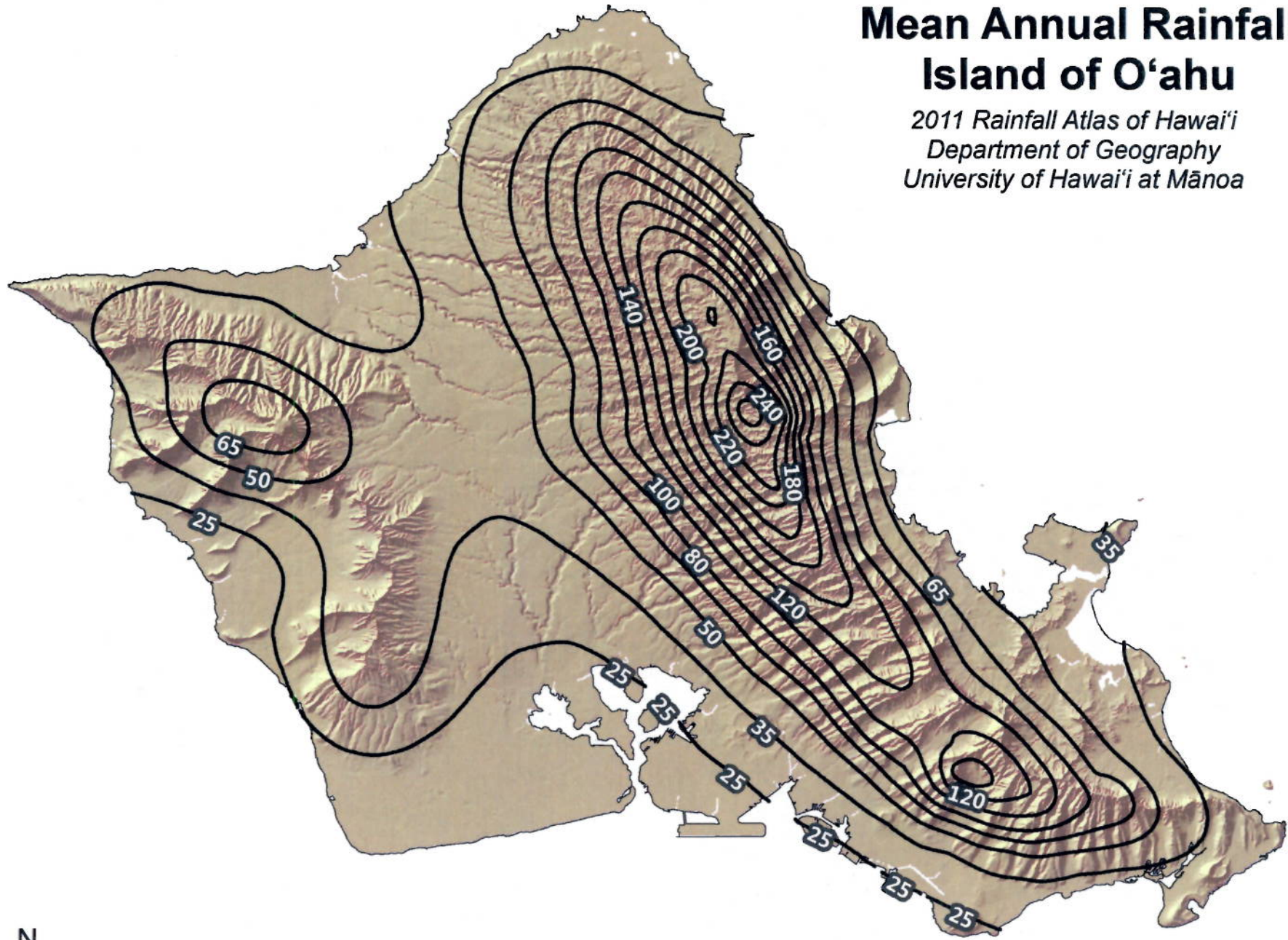
- Will the downward trends in base flows & rain continue or is it a part of a long-term cycle?
- What are the physical causes for the detected trends and variations in streamflow?
- Can regional climate indicators be used to predict streamflow trends and variations?

**MEAN ANNUAL
RAINFALL
1970's**



Mean Annual Rainfall Island of O'ahu

*2011 Rainfall Atlas of Hawai'i
Department of Geography
University of Hawai'i at Mānoa*



0 3.75 7.5 15 22.5 30 Kilometers

Isohyets in inches

Water Conservation is the KEY

- Conservation Extends a Limited Resource and Reduces Pumping Costs and Main Breaks
 - Demand Side Management
 - Leak Detection and Proactive Repair
 - Pipe Corrosion Control
 - Rain Barrel Catchments for Irrigation
 - Education & Costs Incentives to Reduce Water Use
 - Recycled Water

December *The Wonder of Water*

Sponsored by:
HAWAII ENERGY
www.hawaiienergy.com



FIRST PLACE, Kindergarten
Stecya Santos
St. Elizabeth School
Ms. Sommerlyn Leong

“Everything”

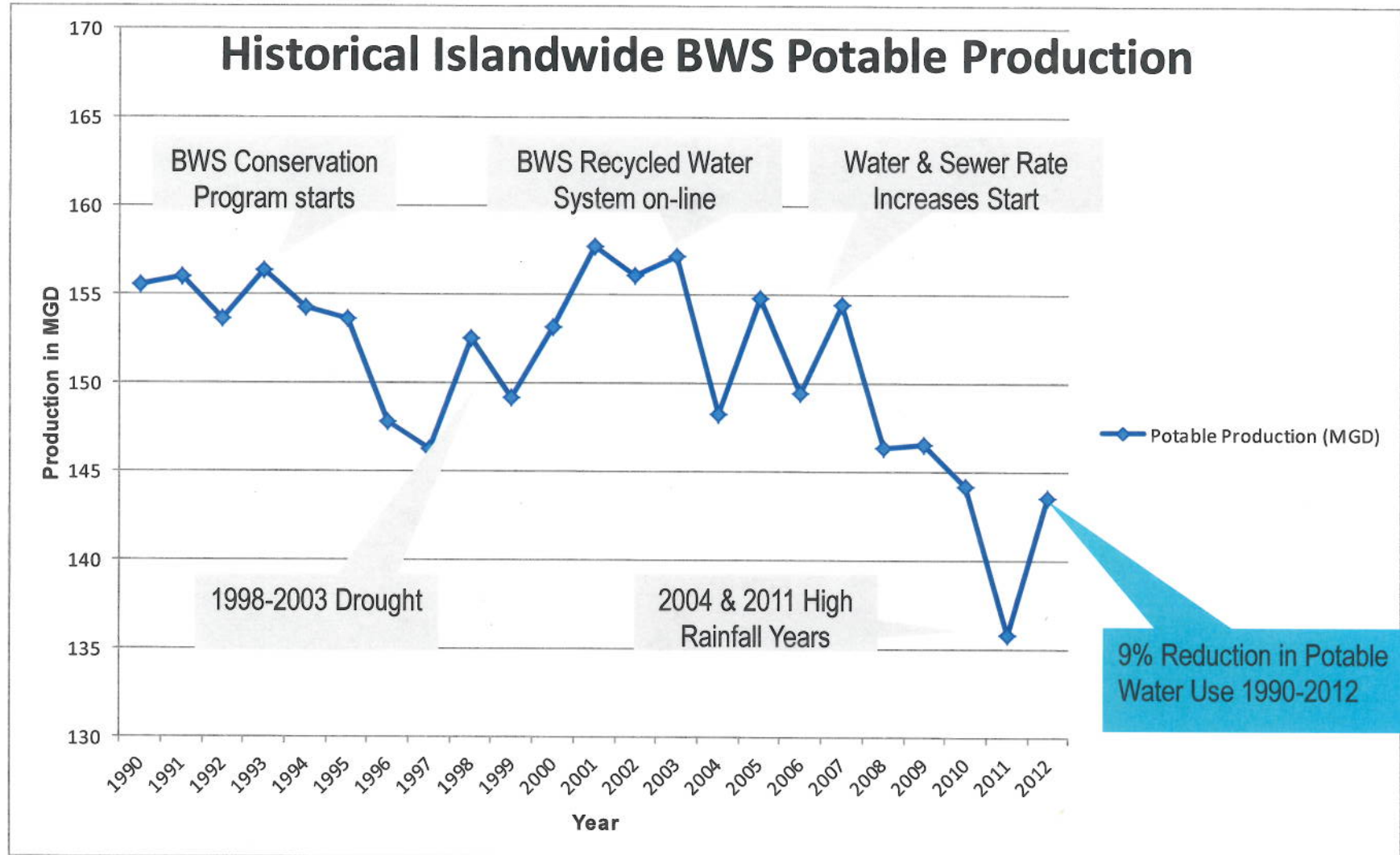
I am everything, but everyone sees me differently.
I am nature's firewood.
I am scientists' ultimate chemical.
I am children's plaything.
I am salvation.

I am the air that the creatures in the sea breathe.
But then I come, and I leave in that same moment.
I cannot say when I will ever return.

It is hope,
That will try to take me to where I need to go.
Sometimes I do not go to the places that beg for me to stay.
My fate and existence
Is never in my control.
Sometimes fools handle me; it is never fair

I am everything;
Priceless and fragile, and everything that anything will ever need.
I am life itself, and its savior.

SECOND PLACE, Grade 11
Torie Chinen-Ramento
Moanalua High School
Ms. Liane Voss



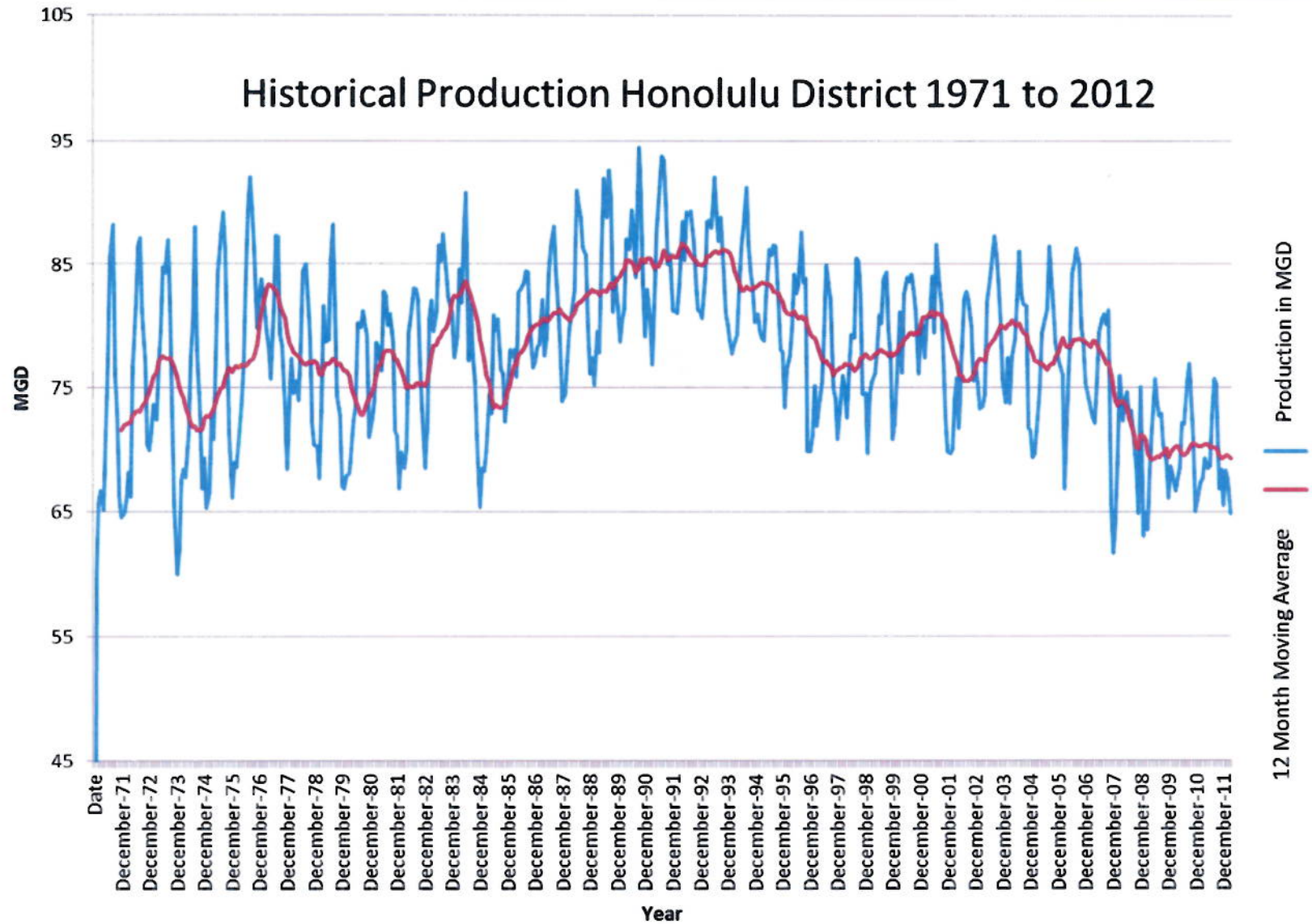
WATER FOR LIFE

Safe and dependable water now and into the future



Board of Water Supply
City and County of Honolulu

Historical Production Honolulu District 1971 to 2012



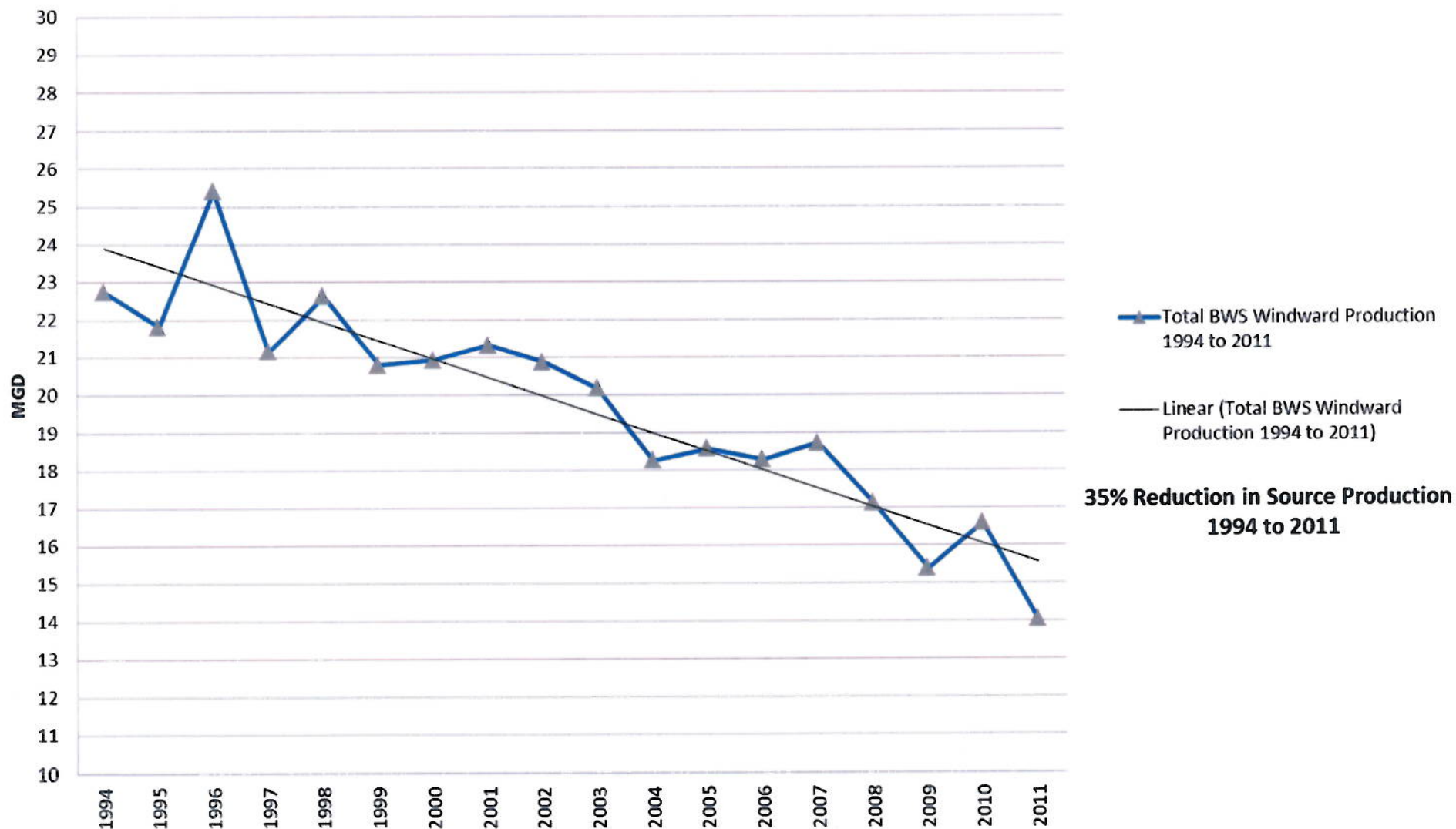
WATER FOR LIFE

Safe and dependable water now and into the future



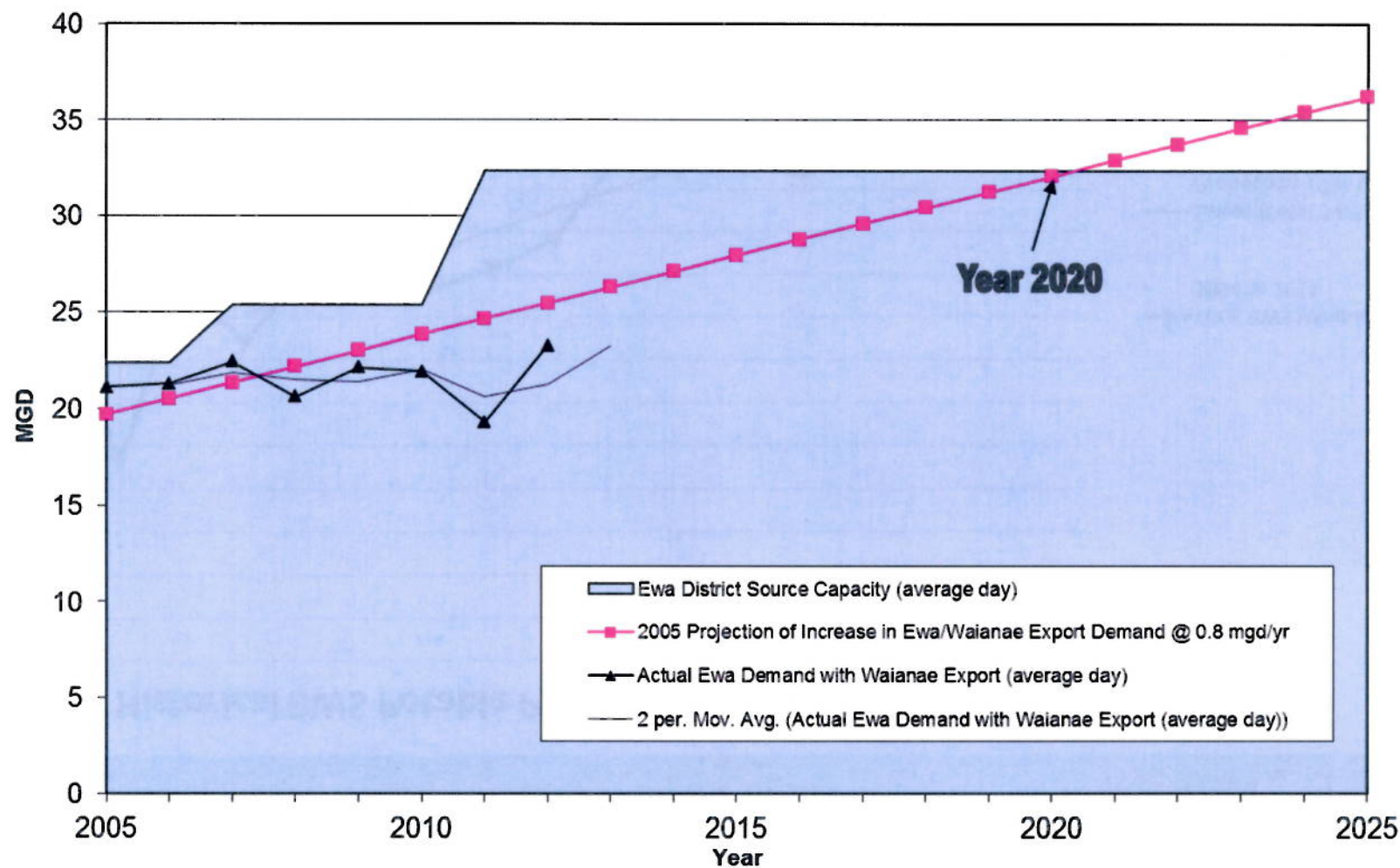
Board of Water Supply
City and County of Honolulu

Historical BWS Potable Production Windward District 1994 to 2011

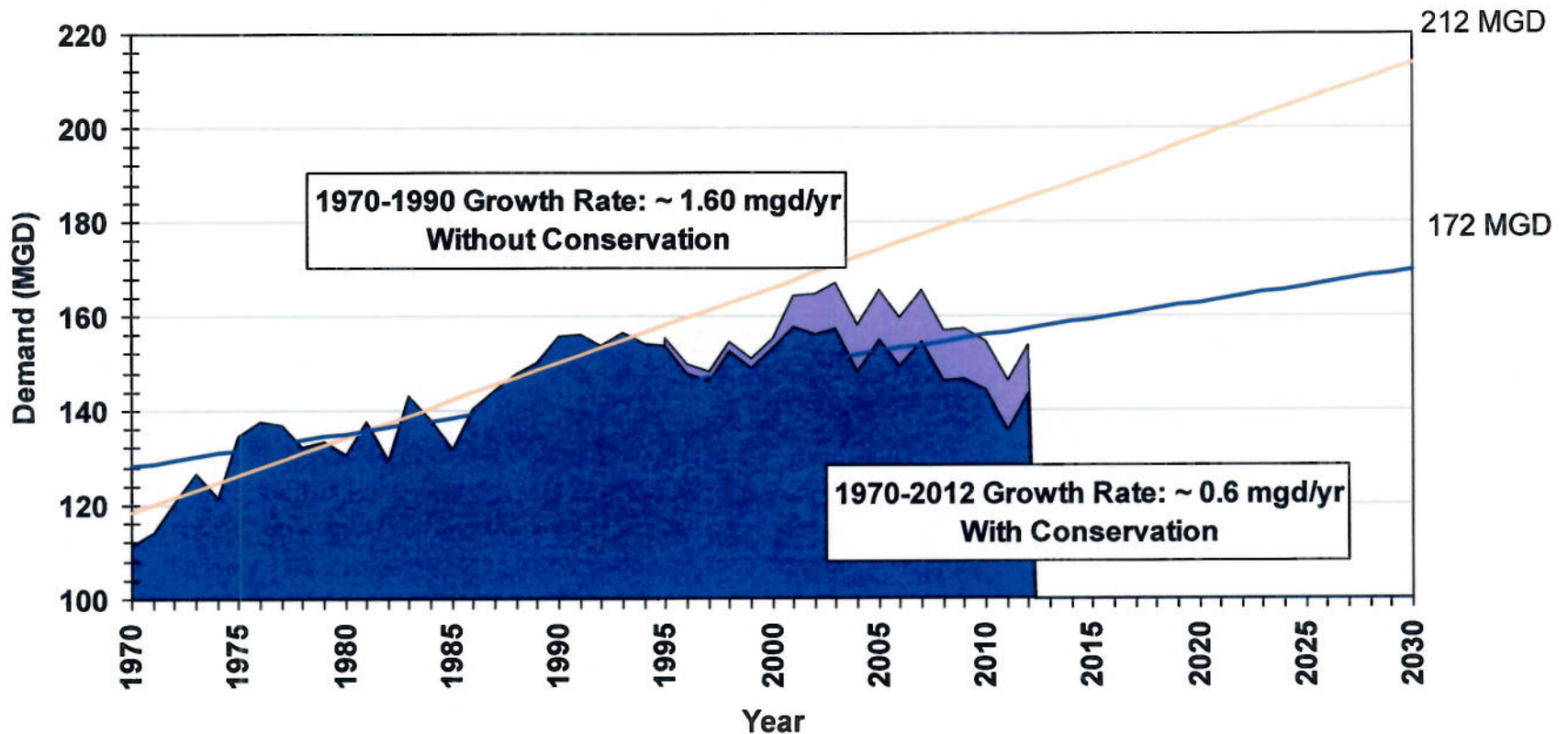




BWS Potable Source and Demand Projection for Ewa District



BWS Potable Water System Demand Projections Historical Potable & Nonpotable Water Use





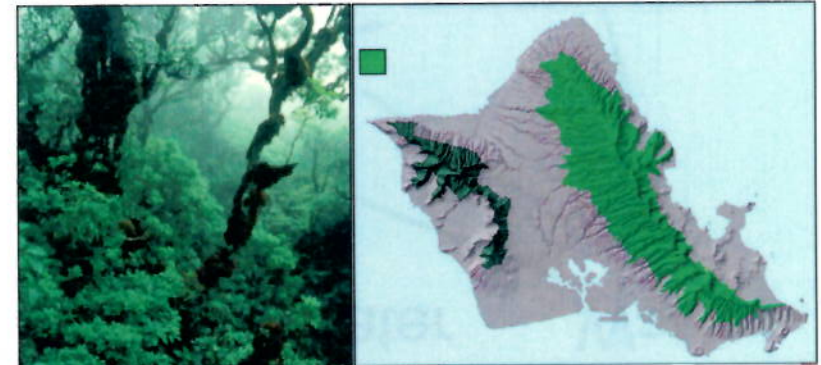
Climate Change Research is Needed

- BWS is engaging UH & USGS to investigate and quantify trends, severity and occurrence of climate change impacts at the watershed level.
- Rainfall forecasting and groundwater modeling tools are being developed.
- BWS can then develop adaptation plans and strategies to ensure sustainable water resources.

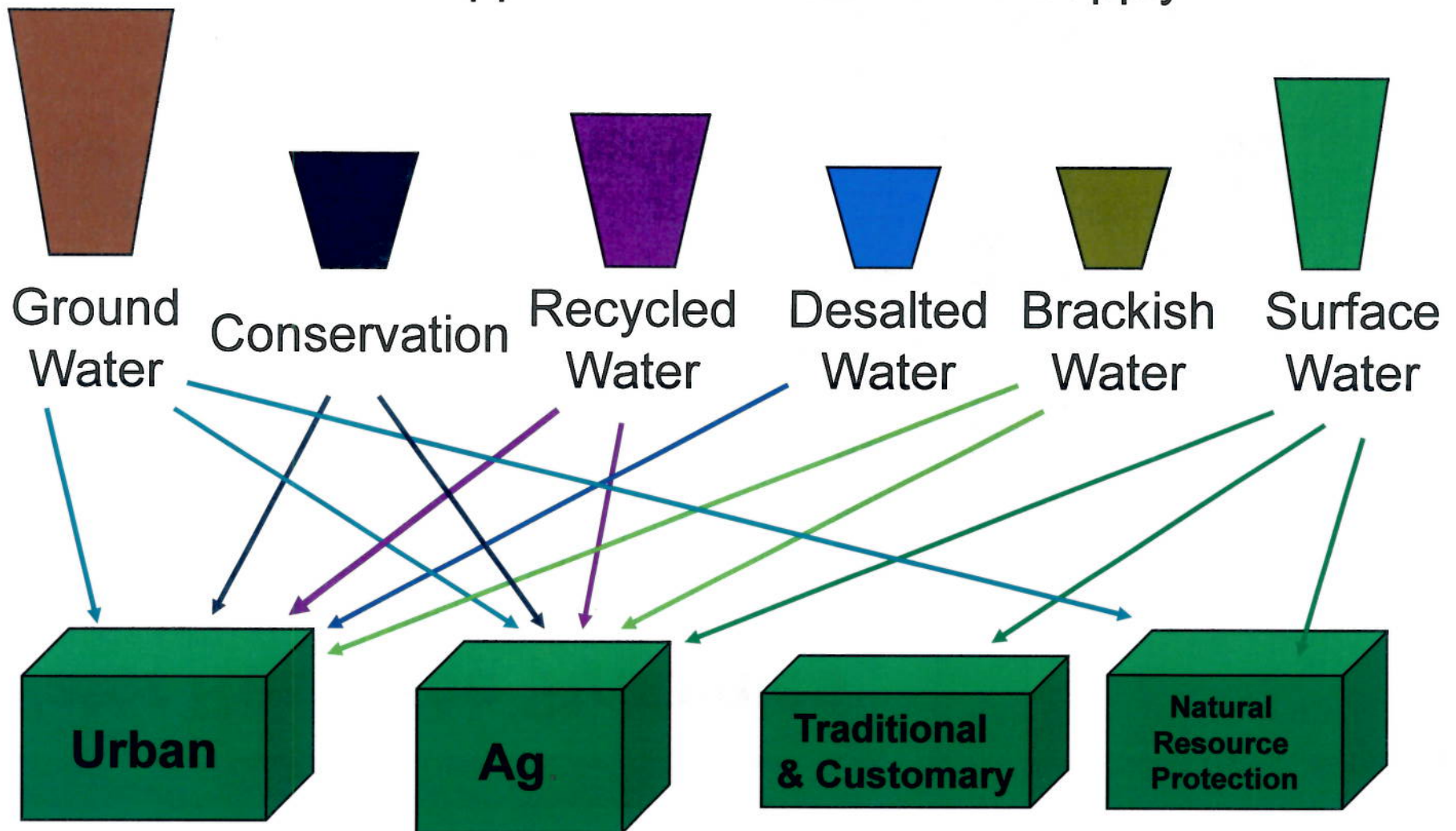


Water Resource Strategies

- Watershed Management
 - Protect Forested Recharge Areas
 - Control Invasive Species
 - Source Water Protection
- Water Conservation
 - Resource
 - Demand-Side Management
 - Infrastructure Efficiency
- Natural and Alternative Water Supplies
 - Groundwater
 - Surface water
 - Recycled and brackish nonpotable
 - Desalination
 - Brackish and Seawater
 - Renewable Energy – Energy Efficiency



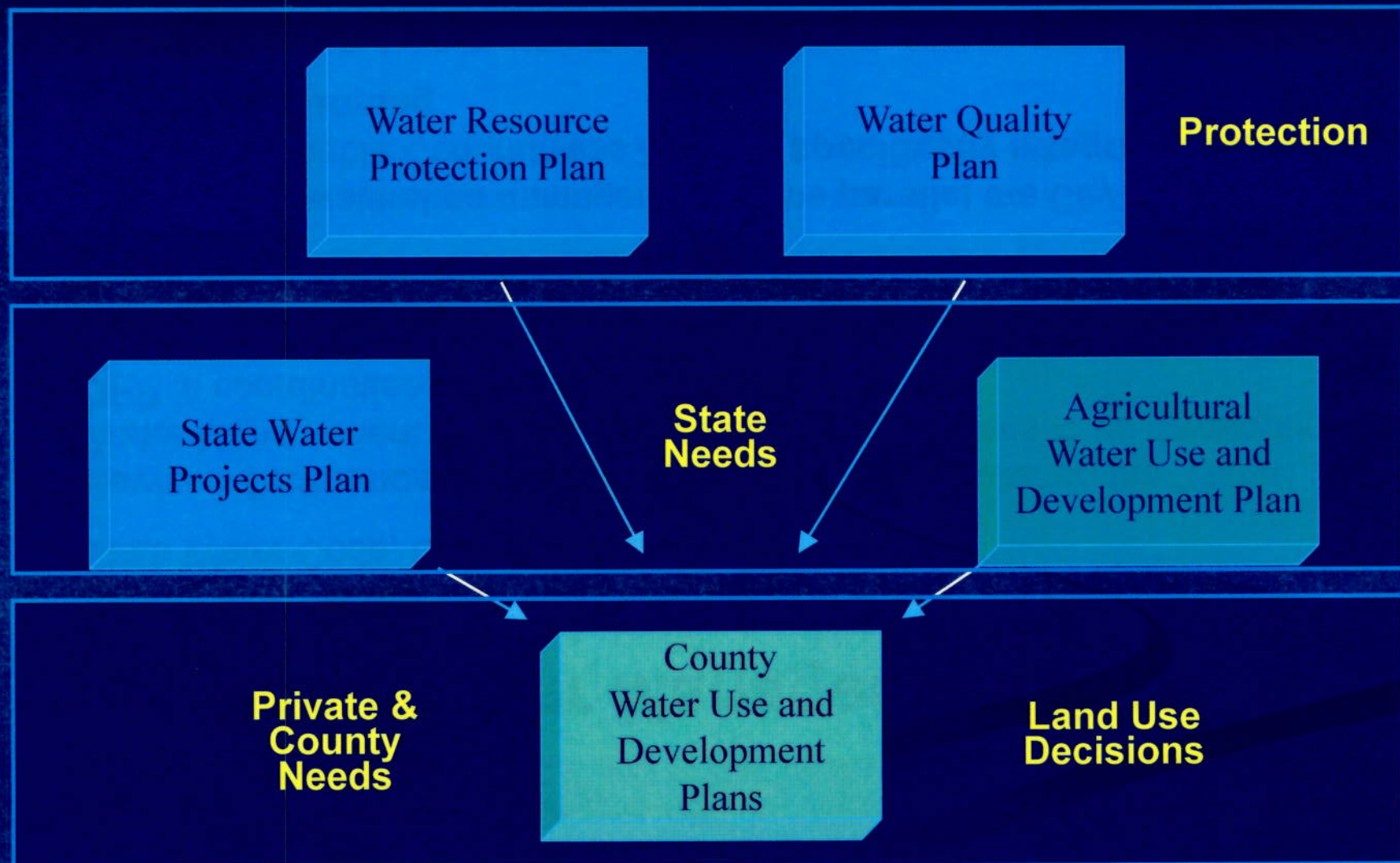
Holistic Approach to Water Use & Supply



Oahu Water Management Plan

- County level “**Water Use and Development Plans**” are required by the State Water Code, Chapter 174C, HRS.
- **Revised Ordinances of Honolulu Chapter 30** established the “Oahu Water Management Plan” comprised of 8 regional plans to be developed by DPP in coordination with BWS & CWRM
- Guiding plans include the **Hawaii Water Plan** and the **City Development Plans and Sustainable Communities Plans**
- The regional watershed management plans **parallel** the City’s Development Plans/Sustainable Communities Plans to **specifically integrate land use and water planning**
- **Key Planning Principles** for these Plans
 - Community-Based
 - Environmentally Holistic and Economically Viable
 - Ahupua`a management perspective
 - Action-oriented
 - In alignment with State and City water and land use plans & policies

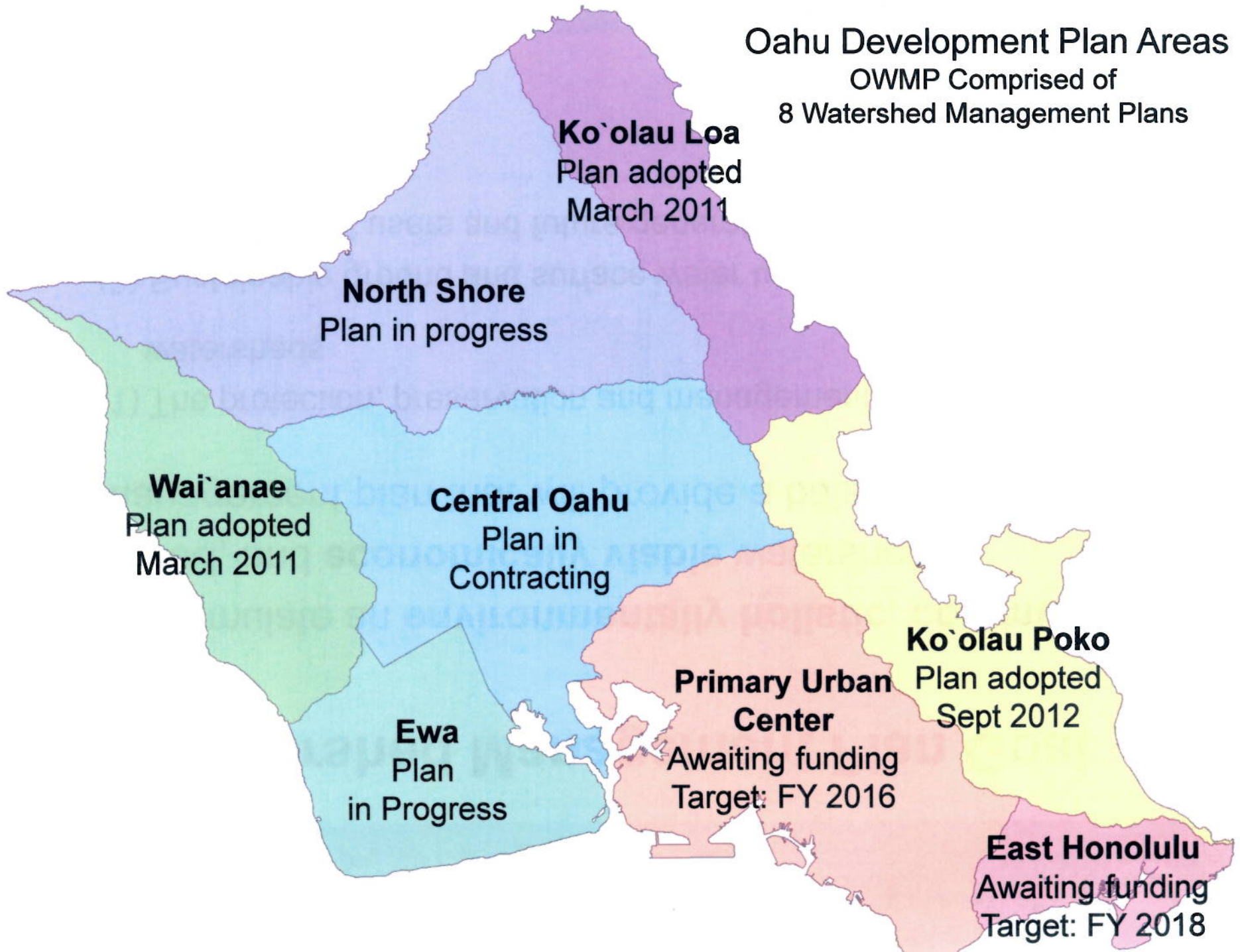
Hawaii Water Plan Components



Courtesy of CWRM

Oahu Development Plan Areas

OWMP Comprised of
8 Watershed Management Plans



Watershed Management Plan Goal

To formulate an **environmentally holistic, community-based, and economically viable** watershed management plan that will provide a balance between:

- (1) The protection, preservation and management of Oahu's watersheds
- (2) Sustainable ground and surface water use and development to serve present users and future generations

Watershed Management Plan Objectives

1. Promote Sustainable Watersheds
2. Protect and Enhance Water Quality & Quantity
3. Protect Native Hawaiian Rights and Traditional & Cultural Practices
4. Facilitate Public Participation, Education & Project Implementation
5. Meet Future Water Demands at Reasonable Costs

WMP TABLE OF CONTENTS

CHAPTERS

ES Executive Summary

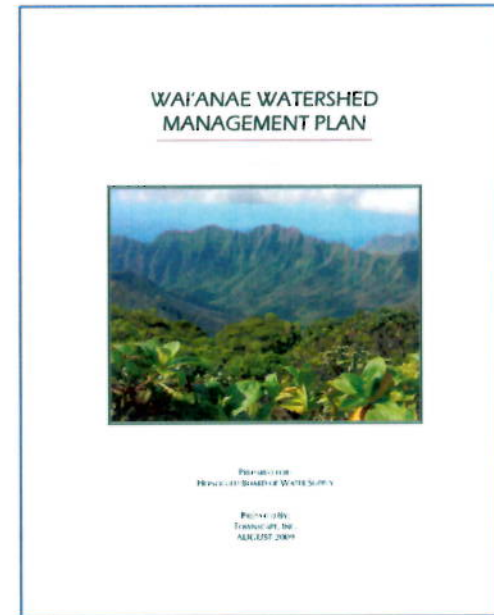
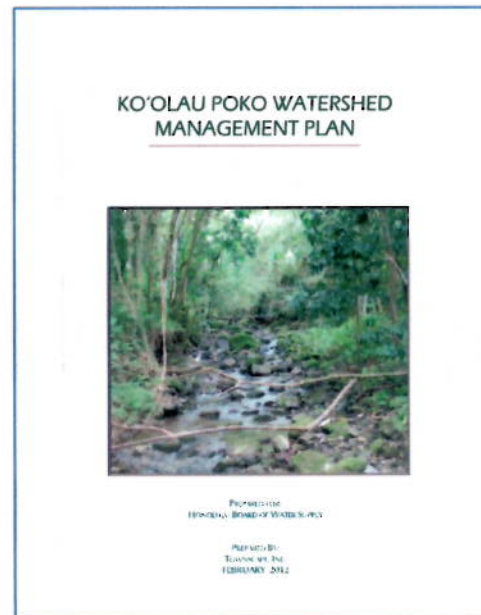
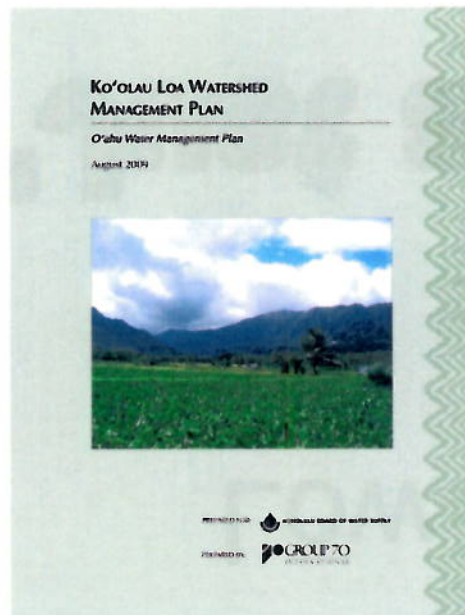
- 1 Oahu Water Management Plan Overview
- 2 Watershed Profile
- 3 Water Use and Projected Demand
- 4 Plan Objectives, Water Supply, and Watershed Management Projects and Strategies
- 5 Implementation

APPENDICES

- A Oahu Watershed Management Plan Framework
- B Plans, Policies, Guidelines, and Controls
- C Oahu Water Use Permit Index
- D Overview of Oahu Hydrogeology
- E Water Use and Demand – Methodology
- F BWS Ko`olau Poko Stream Diversion Survey
- G Neighborhood Board Endorsements

In 2012, the UH Center for Island Climate Adaptation and Policy developed adaptive tools in water resources and climate change adaptation in Hawaii

Regional Watershed Management Plans



- 1 Forward-looking
- 2 Flexible
- 3 Integrated
- 4 Iterative



KA WAI OLA

Water for Life



Board of Water Supply
City and County of Honolulu

Low Groundwater Plan

Drought

"Just a Matter of Time"



Hawaii Drought Plan 2005 UPDATE

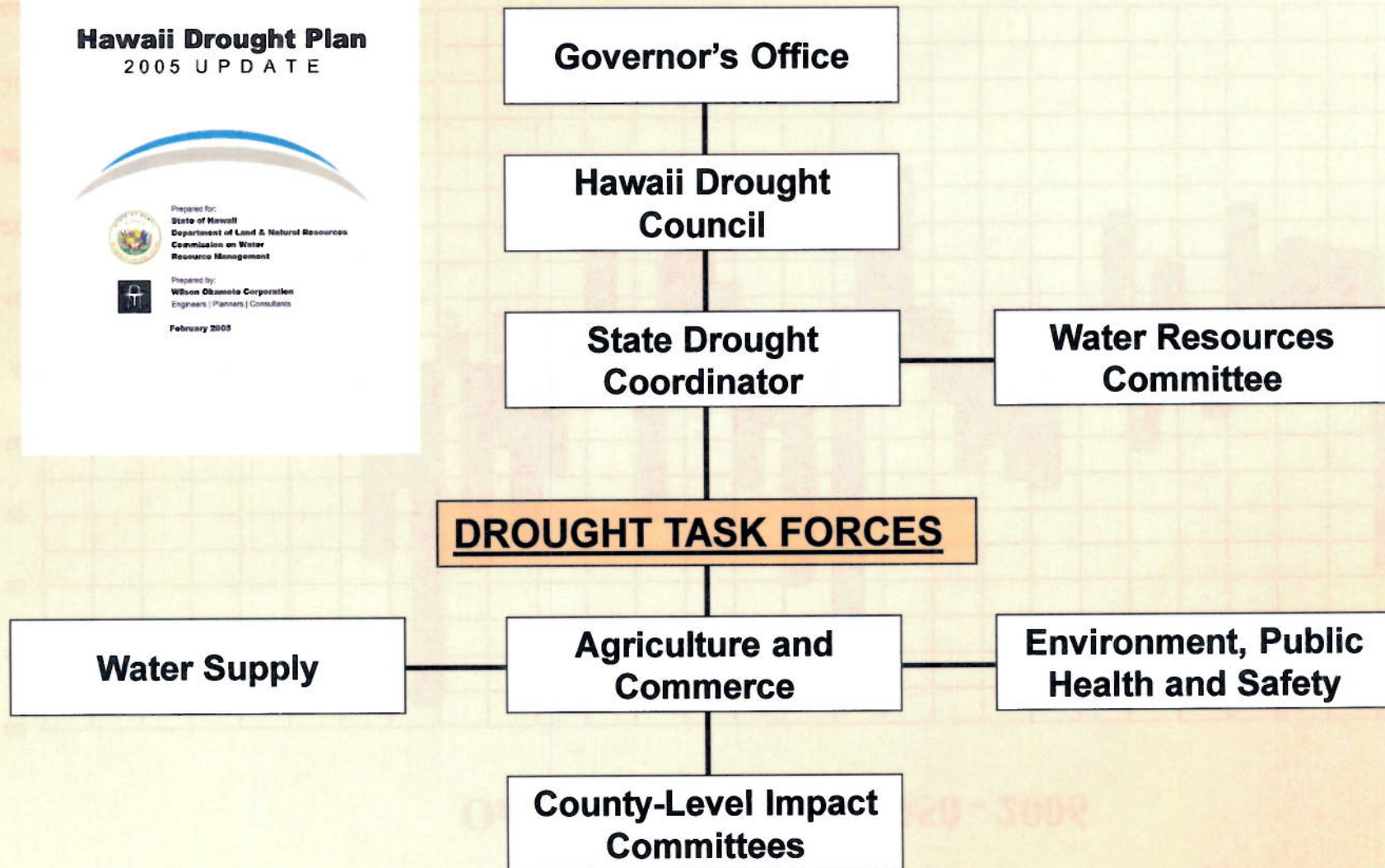


Prepared for:
State of Hawaii
Department of Land & Natural Resources
Commission on Water
Resource Management



Prepared by:
Wilson Okamoto Corporation
Engineers | Planners | Consultants

February 2005



Kauai

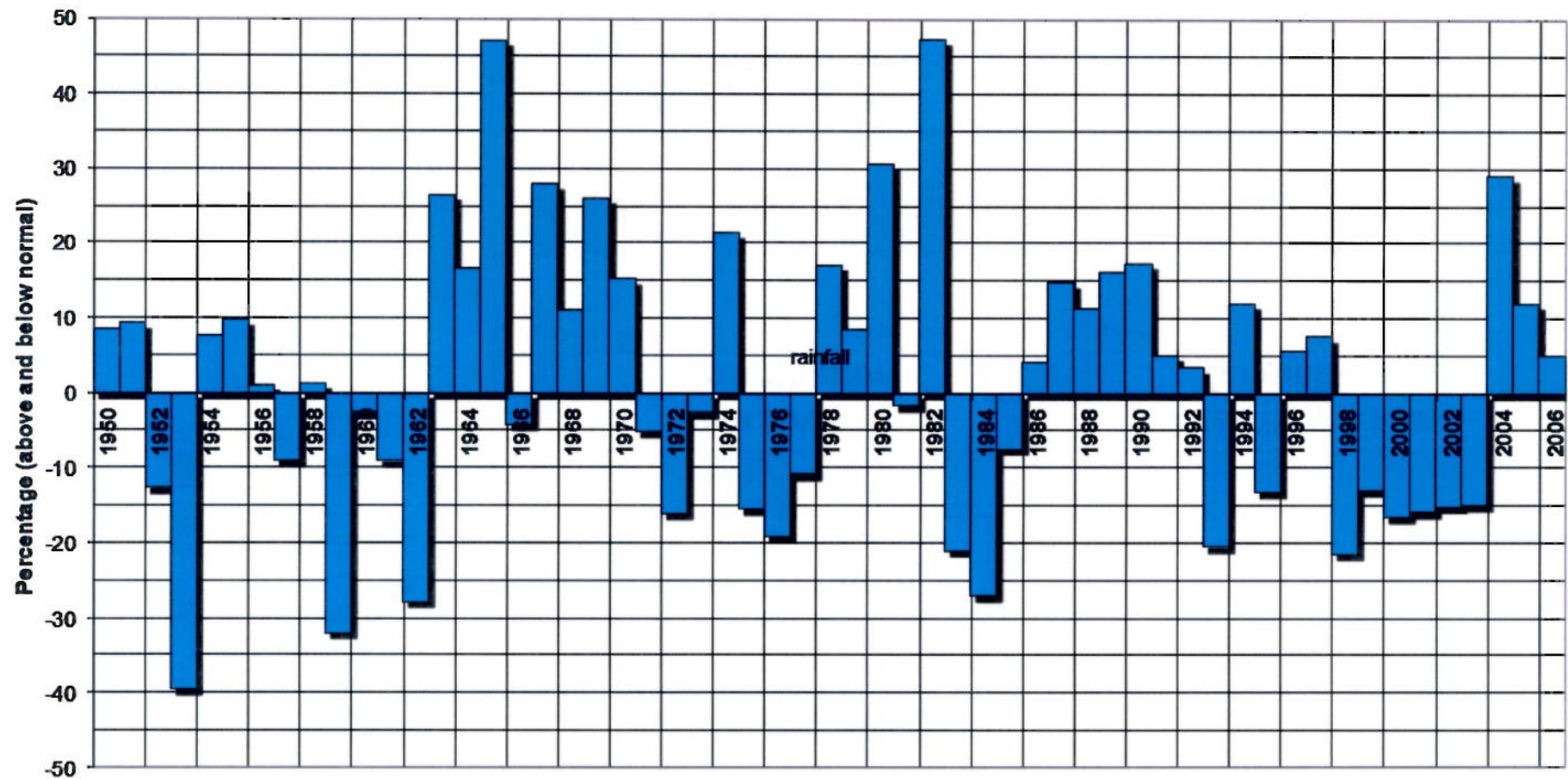
Oahu

Maui

Hawaii



Oahu Rainfall Index 1950 - 2006

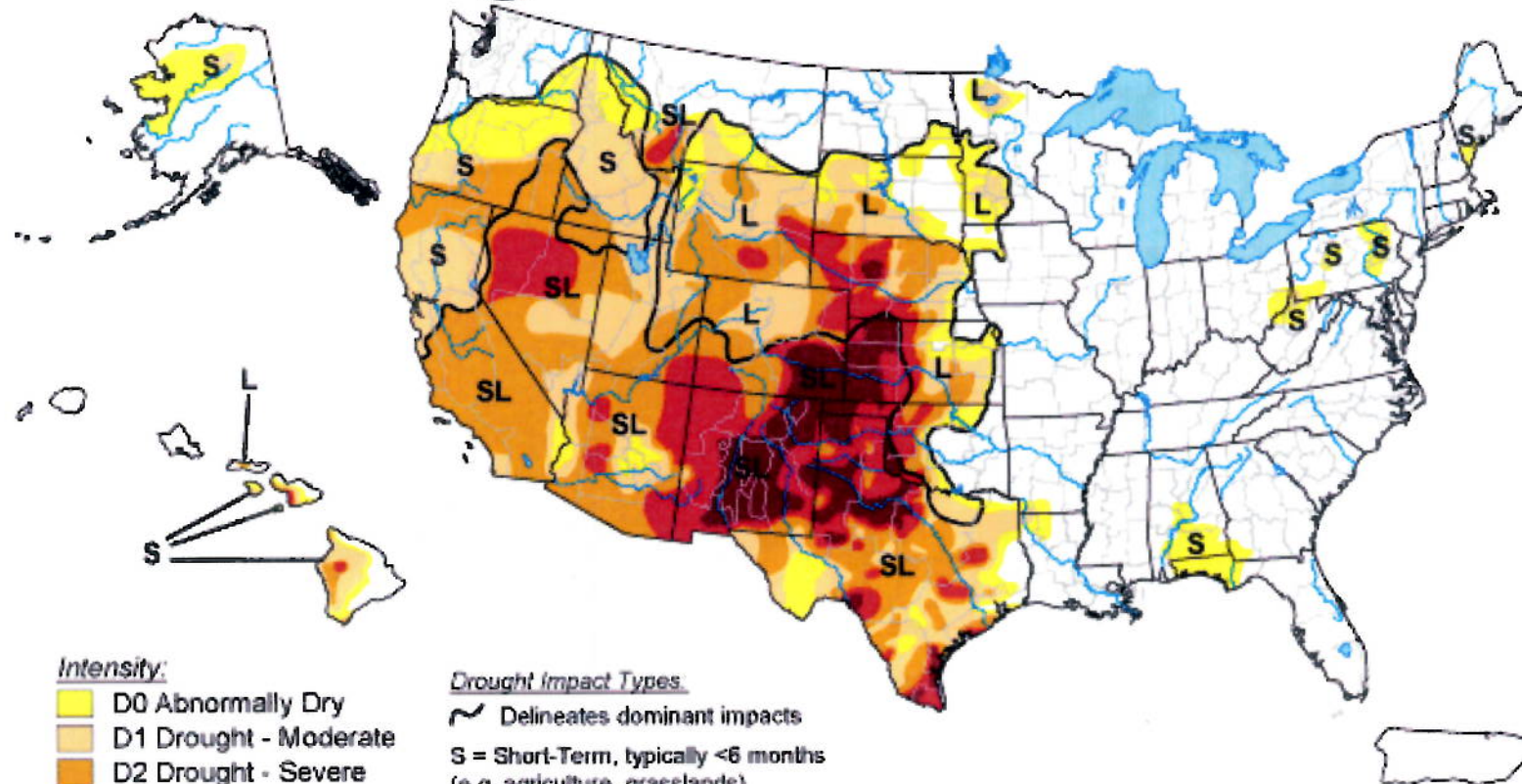




U.S. Drought Monitor

June 18, 2013

Valid 7 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.



Released Thursday, June 20, 2013

Author: Mark Svoboda, National Drought Mitigation Center

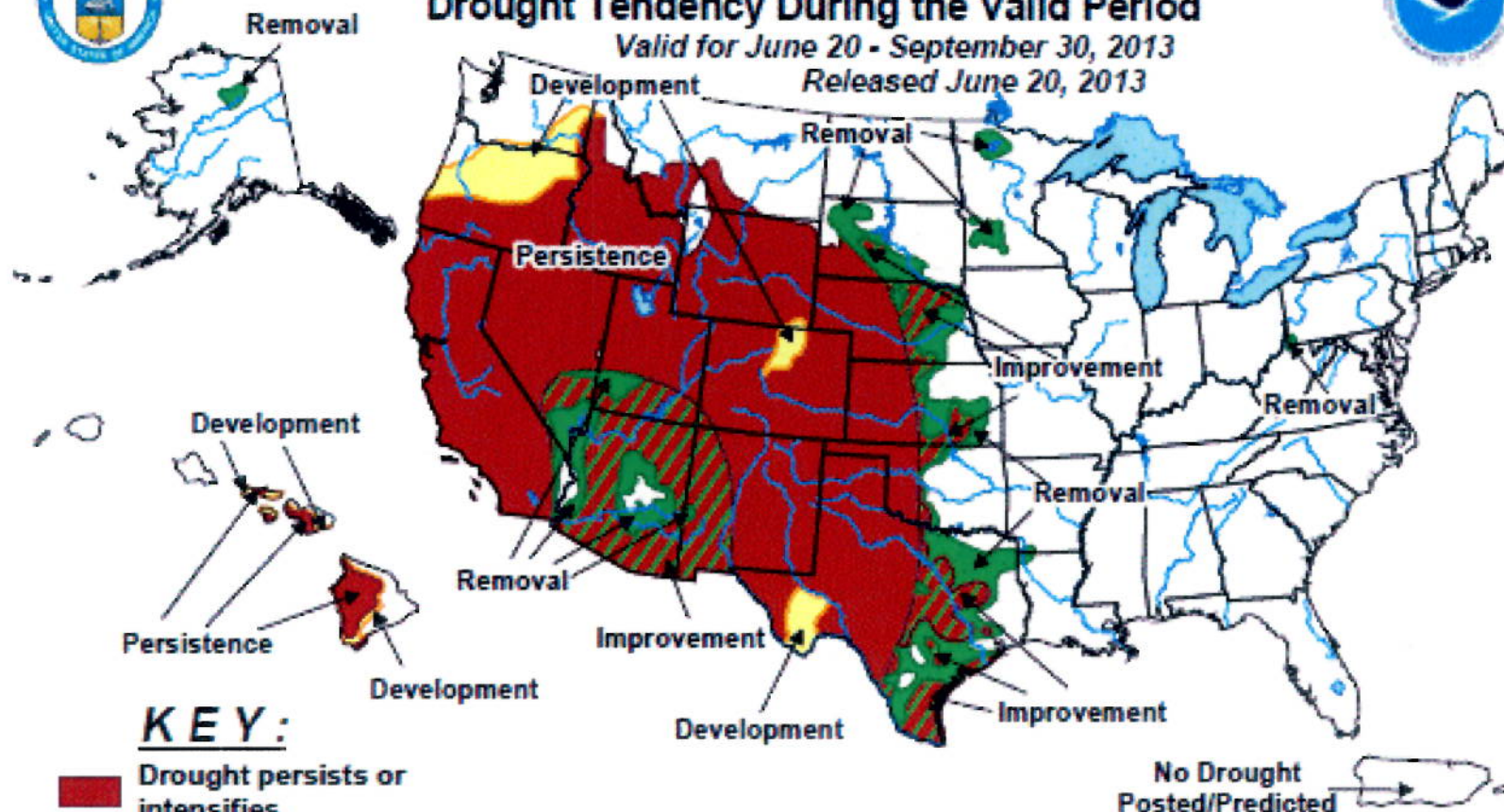
<http://droughtmonitor.unl.edu/>



U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for June 20 - September 30, 2013

Released June 20, 2013



KEY:

- Drought persists or intensifies
- Drought remains but improves
- Drought removal likely
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events – such as individual storms – cannot be accurately forecast more than a few days in advance. Use caution for applications – such as crops – that can be affected by such events. “Ongoing” drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.

NOTE: The Green and Brown hatched areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain. The Green areas imply drought removal by the end of the period (D0 or none)

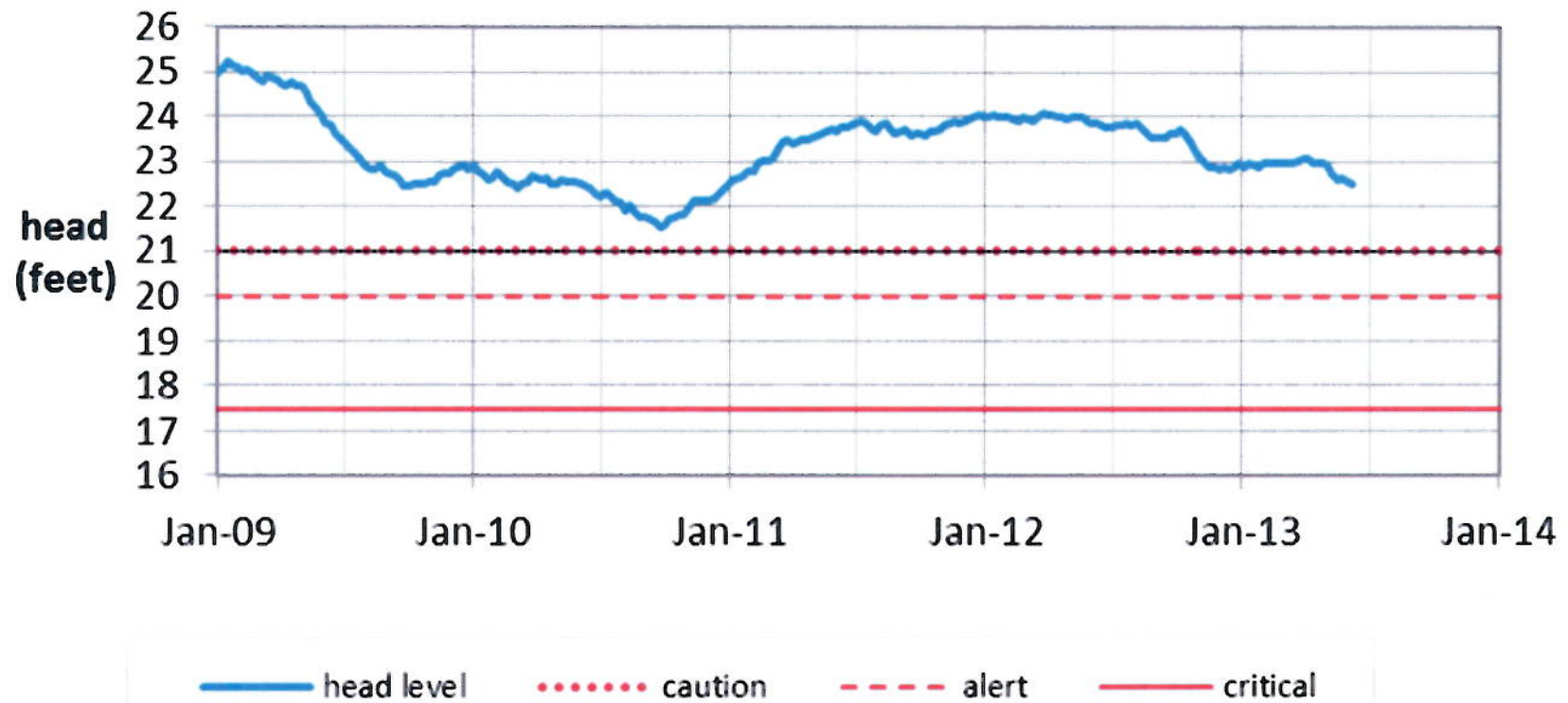


Groundwater Levels for BWS Index Wells

Index Well	Caution	Alert	Critical
Kaimuki	23.5	22.5	20.5
Beretania	21	20	17.5
Kalihi	20.5	19.5	17
Moanalua	18.5	17.5	15
Halawa	15.5	14.5	12
Kalauao	15.5	14.5	12
Pearl City	14	13	12
Waipahu	17	16	15
Hoaeae-Kunia	13	12	11
Makaha	7	6	4
Waialua	11	10.5	10
Kaluanui	16	15	14
Punaluu	17	16	14
Waihee	15 psi	10 psi	5 psi

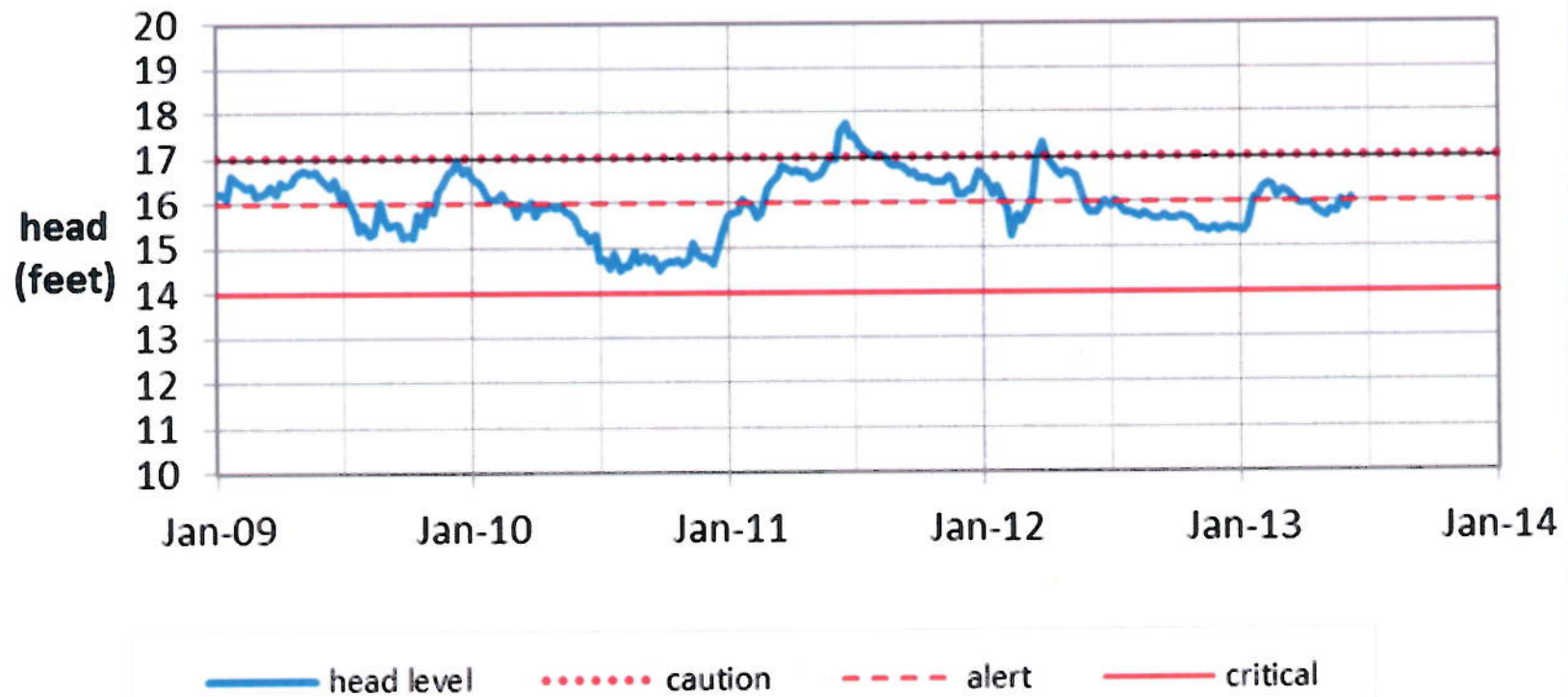


Beretania



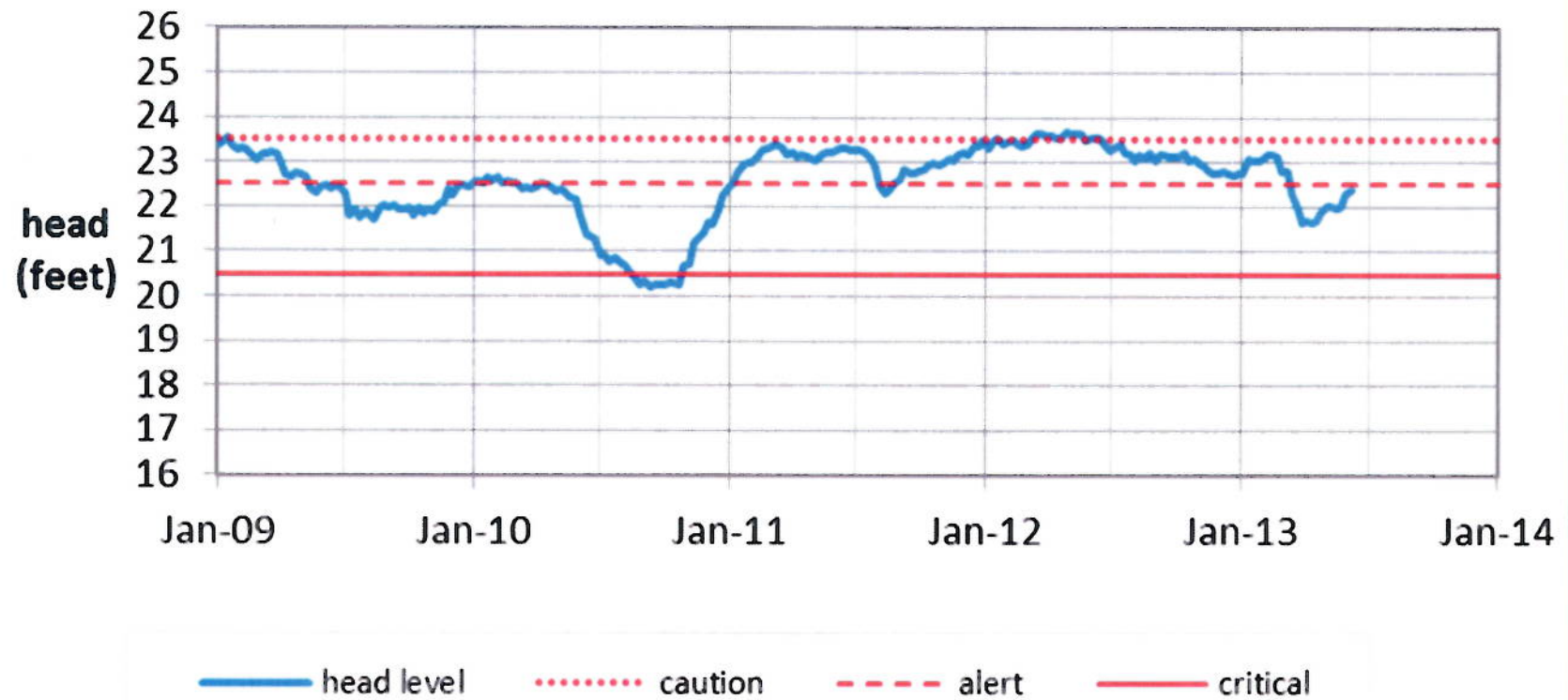


Punaluu



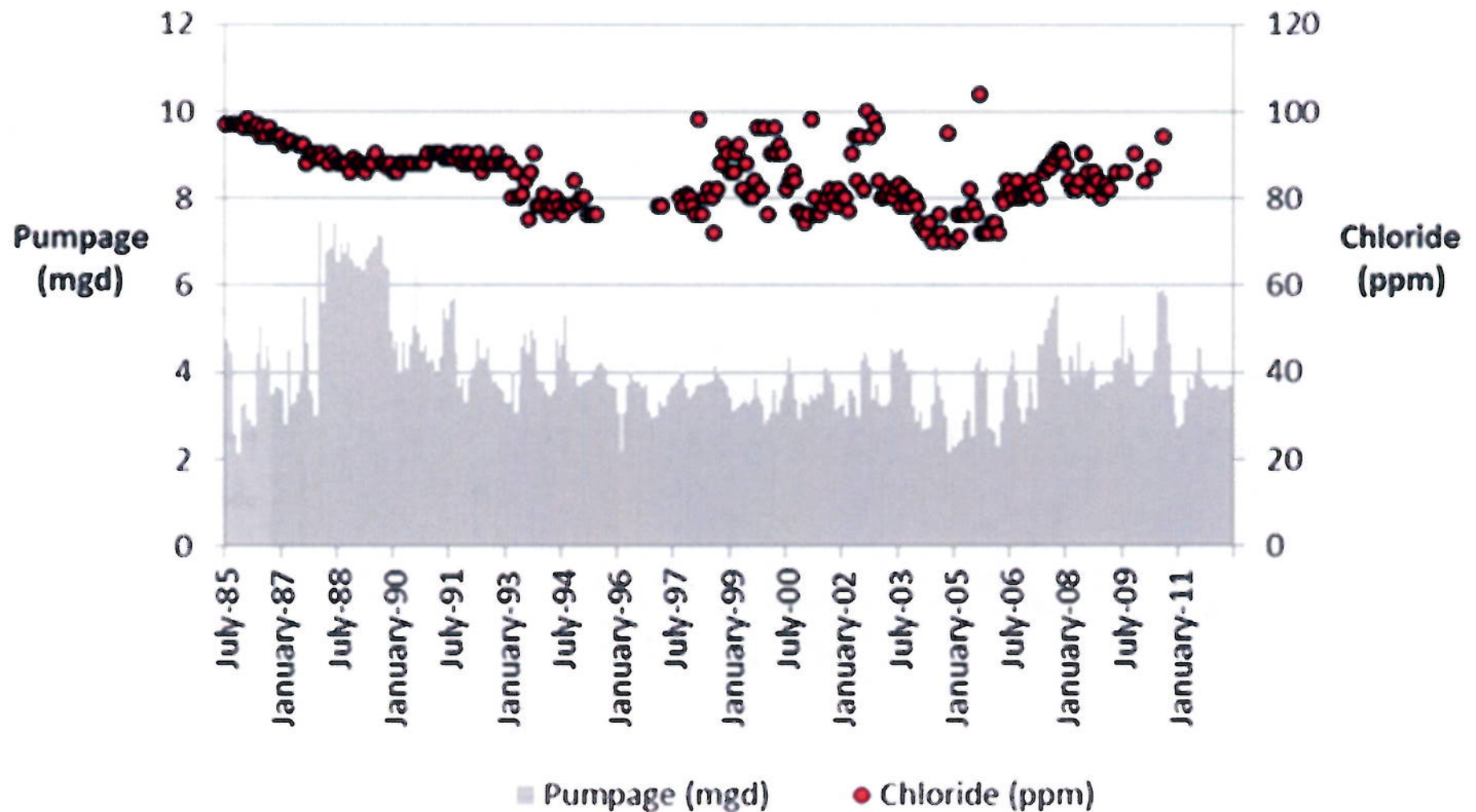


Kaimuki

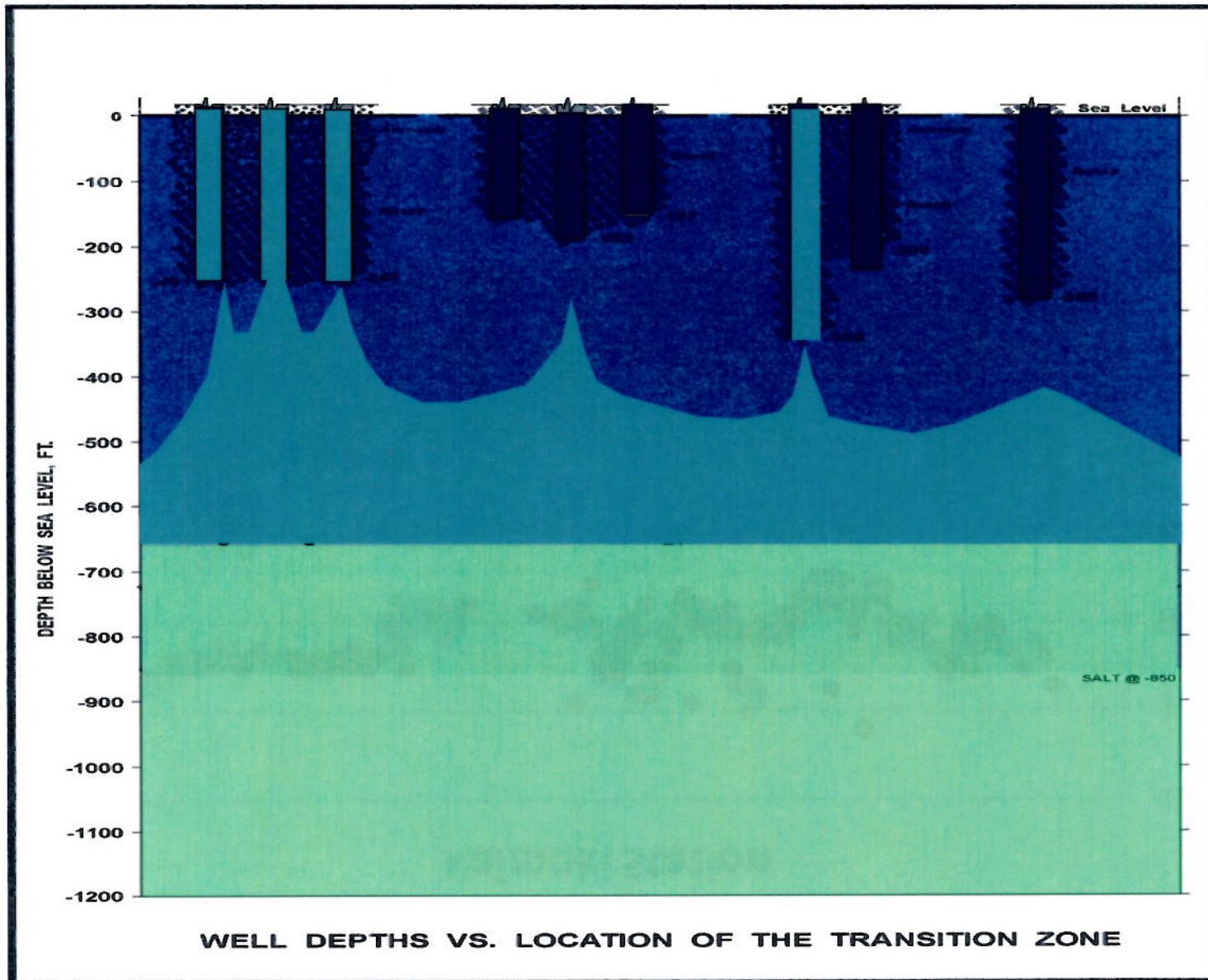




Kaimuki Station



Well Upconing Due to Loss of Recharge and Concentrated Pumping



Courtesy of CWRM



BWS Rules & Regulations

Chapter III, Protection, Development and Conservation of Water Resources

- Sec. 3-318 Low Groundwater Level Conditions
- Sec. 3-319 Mandatory Restrictions Related to Alert Low Groundwater Condition
- Sec. 3-320 Mandatory Restrictions Related to Critical Low Groundwater Condition
- Sec. 3-321 Penalties
- Sec. 3-322 Procedures for Control of Water Use During Low Groundwater Level Condition
- Schedule I: Low Groundwater Levels for 14 Index Wells



Low Groundwater Level Rules Summary

- When 3 or more index wells fall into low groundwater conditions or Chlorides rise by set amounts, the Board may:
 - Inform the public and institute Voluntary water restrictions for a Caution Low Groundwater Condition; or
 - Declare Mandatory water restrictions for the Alert or Critical Low Groundwater Condition
 - Water restrictions progressively ramp up depending on severity:
 - Irrigation, car wash, fountains, washing restrictions,
 - Establish water allotments and issue warnings & citations,
 - Establish water rate surcharges up to a factor of 20.
 - Penalties include a flow restrictor, discontinuation of water service and charged with a misdemeanor, pursuant to Chapter 1.3.1-3.1 ROH



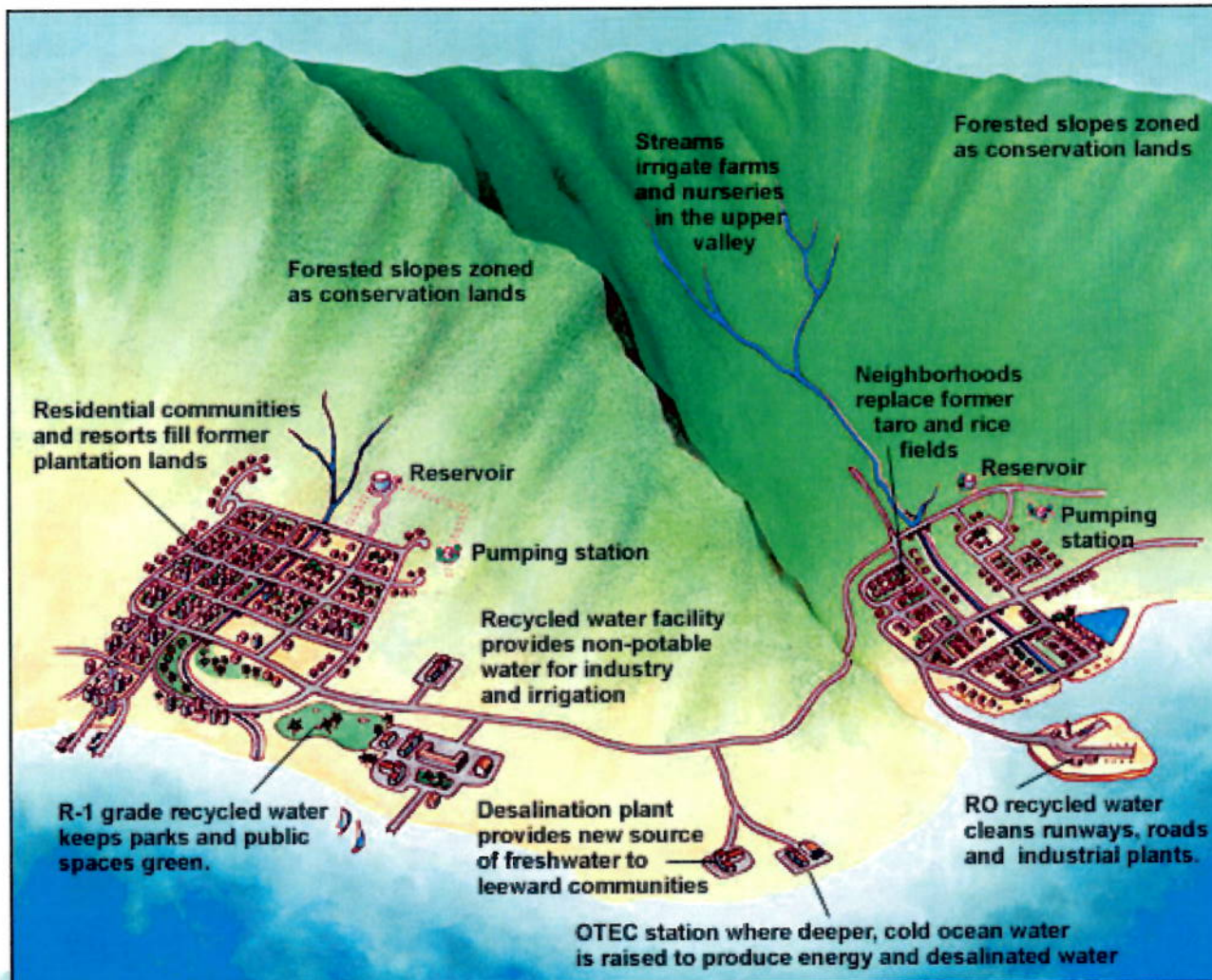
KA WAI OLA

Water for Life

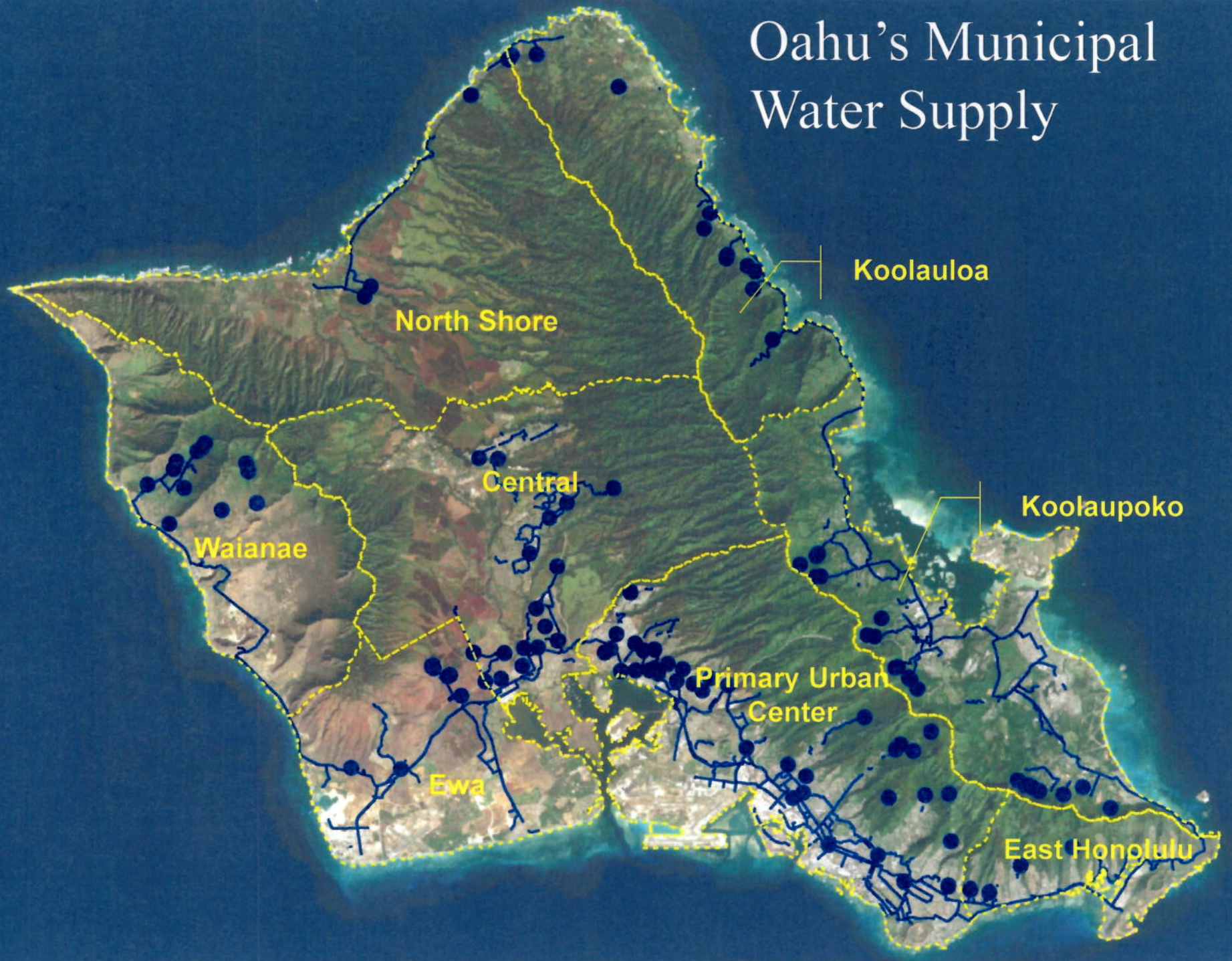


Board of Water Supply
City and County of Honolulu

Oahu's Sustainable Future



Oahu's Municipal Water Supply



MOTION TO
ADJOURN

There being no further business Chair Miyashiro at 3:50 PM called for a motion to adjourn the Open Session. Adam Wong so moved; seconded by Mahealani Cypher and unanimously carried.

Respectfully submitted,



LISA K. KIM

APPROVED:



DUANE R. MIYASHIRO
Chairman of the Board

JUL 22 2013

Date

THE MINUTES OF THE REGULAR SESSION BOARD MEETING ON JUNE 24, 2013 WERE APPROVED AT THE JULY 22, 2013 BOARD MEETING			
	AYE	NO	COMMENT
DUANE R. MIYASHIRO	X		
MAHEALANI CYPHER	X		
THERESIA C. MCMURDO	X		
ADAM C. WONG			ABSENT
KAULANA H. R. PARK			ABSENT
ROSS S. SASAMURA	X		
GLENN M. OKIMOTO			ABSENT