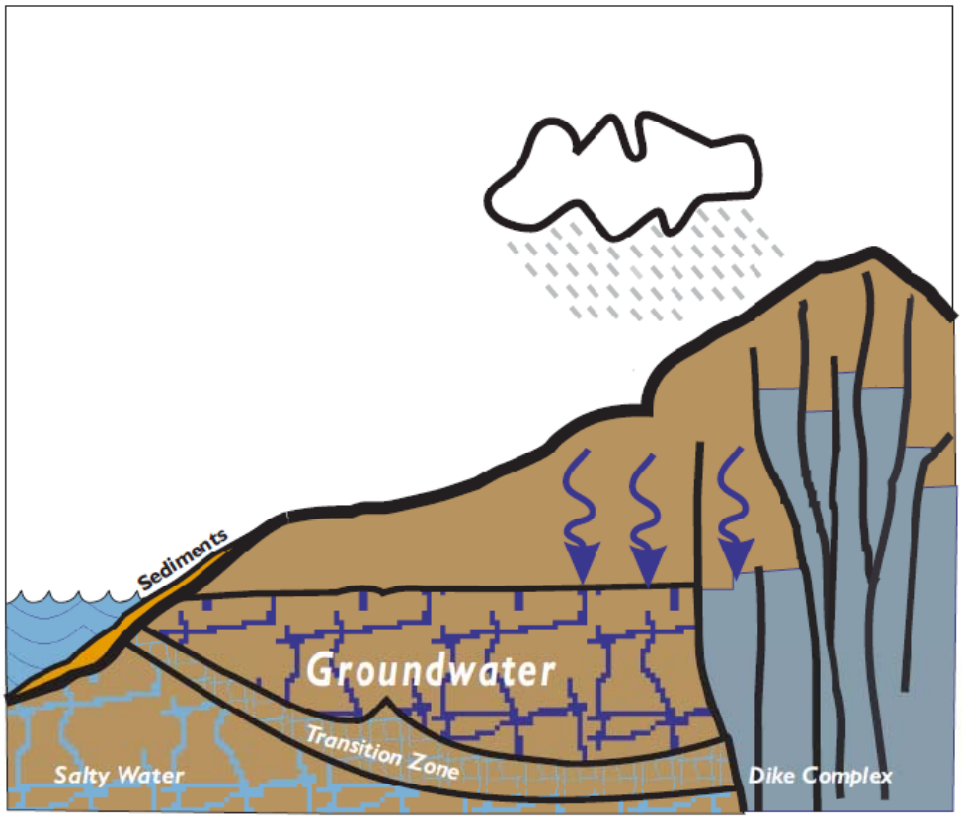
2018 Joint Government Water Conference

Courtyard by Marriott King Kamehameha's Kona Beach Hotel
Kailua-Kona, Hawaii
August 21, 2018

7:30am - 3:45pm

"Protecting Hawaii's Groundwater"



Sponsored by:

HAWAII STATE DEPARTMENT OF HEALTH

2018 - 4th Joint Government Water Conference
"Protecting Hawaii's Groundwater"
Courtyard by Marriott King Kamehameha's Kona Beach Hotel, Kailua-Kona, Hawaii
Tuesday, August 21, 2018 ~ 7:30 am - 3:45 pm

Drinking Water/Groundwater/Wastewater Professional(s):

The Department of Health (DOH) Environmental Health Administration (EHA) offices/branches invite you to register for the 4th Joint Government Water Conference. The Conference is intended to provide water industry personnel, government agencies, and other water-related organizations with an update of the groundwater protection strategies and activities being conducted in the State of Hawaii by the various DOH EHA offices/branches. In addition, we have invited several other water related agencies to give presentations on their activities and how it relates to or concerns our water systems and water-related activities. This conference will allow participants to keep abreast of the activities of the water-related government agencies, meet our staff and other water system personnel, ask questions and provide us with feedback, and learn what is in store for the drinking water/groundwater/wastewater industry in the coming years. We look forward to your attendance at our 4th Joint Government Water Conference.

Note: **You must pre-register for this conference by TUESDAY, August 14, 2018.**No registration on the date of the conference will be accepted. **Registration is limited**. Priority will be given to people working professionally in water (groundwater, drinking water & wastewater) and government environmental protection personnel. A meal will be served as an integral part of the Conference.

Register On-line at:
http://events.egov.com/eventreg/HI/event.htm?name=4thjointgovernmentwaterconferencekona

TENTATIVE AGENDA (as of August 3, 2018)		
7:30am	Registration	
8:15am	*Opening Remarks and Introduction*	***Joanna Seto(DOH) & Keith Okamoto (HDWS)***
8:30am	*SDWB: Groundwater Protection Strategy*	***Joanna Seto (DOH)***
9:00am	*WWB: Cesspool Strategy&Water Reuse*	***Sina Pruder (DOH)***
9:30am	*CWB: Polluted Runoff Program Strategy*	***Mike Burke (DOH)***
10:00am	Break	
10:30am	*HEER: Water Quality Activities*	***Fenix Grange (DOH)***
11:00am	*DOA-Pesticides: Pesticides in Groundwater*	***Greg Takeshima (DOA)***
11:45am	*LUNCH: Native Oysters for Water Quality Improvement.*	***Rhiannon Chandler-'Iao (Oahu Waterkeepers)***
	CONCURRENT SESSION A(Cesspool)	CONCURRENT SESSION B(Water Quality)
1:00pm	*Modeling the Environmental Drivers of Coral Bleaching in Hawaii: Does Impacted Water Quality Affect Bleaching Tolerance?* ***Thomas Oliver (UH)***	*Groundwater Monitoring Status Report* ***Dan Chang (DOH)***
1:30pm	*Detecting Sewage Pollution in the Puako Watershed.****Steven Colbert (UH-Hilo)***	*Importance of Watershed Protection to Groundwater - Part 1.****Katie Ersbak (DLNR)***
2:00pm	Break	
2:15pm	*Nitrogen Reducing Technologies for Individual Wastewater Systems* ***Sina Pruder (DOH)***	*Importance of Watershed Protection to Groundwater - Part 2.****Colleen Cole (Three Mountain Alliance)***
2:45pm	***Discussion Session:*** *Funding and Implementing Cesspool Upgrades–"now to 2050."*	*Protecting Hawaii's Groundwater Through Coordination and Collaboration with Other Agencies & Outreach and Education Efforts.*
3:30pm	Wrap-up	

For more information, contact the Safe Drinking Water Branch at (808) 586-4258.

We provide access to our activities without regard to race, color, national origin (including language), age, sex, religion, or disability. Write or call our Affirmative Action Officer at Box 3378, Honolulu, HI 96801-3378 or at (808) 586-4616 (voice) within 180 days of a problem.

MORNING SESSION

HAWAII'S GROUNDWATER PROTECTION STRATEGY

Joanna L. Seto, P.E.
Safe Drinking Water Branch, Hawaii Department of Health

BIOGRAPHY

Joanna L. Seto, P.E., is the Engineering Program Manager of the Department of Health's Safe Drinking Water Branch. She has more than 25 years of combined private and public engineering experience working at Hawaiian Dredging & Construction Company, Sato & Associates, Inc., and the Department of Health, Clean Water Branch and Safe Drinking Water Branch. Joanna is currently the webmaster of the American Water Works Association-Hawaii Section. She was past president of the Hawaii Section of the American Society of Civil Engineers and is involved with Na Wahine Softball Club and as class representative for the `Iolani Bulletin. She graduated from `Iolani School and Washington University in St. Louis, Missouri where she earned a Bachelor of Science in Civil Engineering.

ABSTRACT

The Hawaii Department of Health (DOH) Groundwater Protection Strategy was finalized in June 2017. The Safe Drinking Water Branch will present the three goals of the strategy and the related objectives.

Goal 1: Monitor and assess groundwater quality.
Goal 2: Identify and prioritize groundwater contaminations threats.
Goal 3: Mitigate priority contamination threats and prevent contamination.

This strategy involves multiple DOH branches and offices (and potential funding sources): Safe Drinking Water Branch (GW106/DWSRF 15%), Wastewater Branch (CWSRF), Clean Water Branch (SW106), Solid & Hazardous Waste Branch (SHWB), Hazard Evaluation and Emergency Response Office (HEER).

Hawaii Groundwater Protection Strategy

Hawaii Department of Health Coordinating Branches/Offices:
Safe Drinking Water Branch *(GW106/DWSRF 15%)*, Wastewater Branch *(CWSRF)*, Clean Water Branch *(SW106)*, Solid & Hazardous Waste Branch *(SHWB)*, Hazard Evaluation and Emergency Response Office *(HEER)*
June 2017

Mission: To safeguard groundwater quality and public health by protecting Hawaii's groundwater from contamination. *(potential funding source listed within parentheses)*

Goal 1: ***Monitor and assess groundwater quality****. (GW106)*

Objective 1: Collect and analyze groundwater monitoring data with focus on priority threats to groundwater quality.
Objective 2: Work with other agencies that collect groundwater data to understand what data they collect and how it is collected.
Objective 3: Every four years, generate a Groundwater Status Report which provides a review, analysis, and summary of groundwater monitoring data to understand contaminant trends and sources of contamination. The Report shall include a list of proposed future monitoring of contaminants of concern with rationales and priorities based on severity of public health impacts.

Goal 2: ***Identify and prioritize groundwater contamination threats.***

Objective 1: Recognize that groundwater quality monitoring since the 1990s has shown that the priority threats to groundwater quality as determined by DOH and review of data are as follows *(GW106)*:

Priority Threats to Groundwater Quality - 2017
Onsite sewage disposal systems/cesspools/injection wells (WWB/CWB/SDWB)
Large scale use of recycled water (WWB/SDWB)
Large fuel storage facilities (SHWB/SDWB)
Increasing nitrate concentrations (WWB/CWB/SDWB)
Agricultural chemicals (HEER/SDWB)

Objective 2: Identify future threats to groundwater quality and prioritize for Goal 1 or Goal 3 follow-up *(GW106/CWSRF/SW106/319/HEER/SHWB)*.

Goal 3: ***Mitigate priority contamination threats and prevent contamination.***

Objective 1: Coordinate protection efforts with other branches/offices/agencies:

- Safe Drinking Water Branch Underground Injection Control Program - issuing permits for discharges to wells
- Wastewater Branch - protection from onsite sewage disposal systems and cesspools
- Clean Water Branch - surface water protection that also protect groundwater
- Solid & Hazardous Waste Branch - leaking underground storage tanks, landfills, and other wastes that may contribute to groundwater contamination
- Hazard Evaluation and Emergency Response Office - toxicology and health impacts of groundwater contamination and use of hazardous chemicals and pesticides
- Environmental Planning Office - review of new development projects and their impacts to groundwater
- Department of Land and Natural Resources, Commission on Water Resource Management – water quality planning via the Hawaii Water Plan, Water Resources Protection Plan – Section 10, Water Use Permits, Well-drilling applications, salt-water intrusion data
- Department of Agriculture – pesticide use and application

Objective 2: Coordinate use of funding sources to support the HIGWPS: Safe Drinking Water Branch (GW106/DWSRF 15%/DWSRF Fees), Wastewater Branch (CWSRF), Clean Water Branch (SW106, 319), Solid & Hazardous Waste Branch (SHWB), Hazard Evaluation and Emergency Response Office (HEER)
Objective 3: Coordinate the regulatory framework used by each branch/office/agency to protect groundwater from the prioritized contamination threats (e.g., Code of Federal Regulations, Hawaii Revised Statutes, Hawaii Administrative Rules, EPA Guidelines and online tools).

HAWAII'S CESSPOOL STRATEGY and WATER REUSE

Sina Pruder, P.E.
Wastewater Branch, Hawaii Department of Health

BIOGRAPHY

Sina Pruder received her engineering degree from the University of Hawaii. She also has her professional engineering license in civil engineering. She has worked in the Wastewater Branch for 24 years, where she is currently the Branch Chief. Wastewater Branch is responsible for regulating onsite wastewater systems (including cesspools) and water reuse in the State of Hawaii.

ABSTRACT

This presentation will cover cesspool and water reuse activities in the state of Hawaii. Topics include: New requirements on cesspools and mandatory upgrades by 2050, available income tax credits for cesspool upgrades, cesspool upgrade prioritization legislative report and the cesspool conversion working group required by Act 132 of 2018. The work group was established to develop a long-range, comprehensive plan for cesspool conversion statewide of all cesspools by 2050.

Recycled water usage statewide, trends and challenges, and update of the Water Reuse Task Force authorized by House Concurrent Resolution 86 D1 of 2018 to identify barriers and solutions to expand water reuse in Hawaii. Recent findings have raised concerns about the long-term security of fresh water in Hawaii, and increasing the amount of water reuse in the State will help alleviate pressure on fresh water drinking supplies.

CWB: POLLUTED RUNOFF PROGRAM STRATEGY

Michael T. Burke
Clean Water Branch – Polluted Runoff Control Program
Hawaii Department of Health

BIOGRAPHY

Michael T. Burke is the Program Specialist of the Department of Health's Clean Water Branch, Polluted Runoff Control (PRC) Program. He has been with PRC for almost ten years and supervisor for the past three. Prior to joining PRC, he worked at the Department of the Attorney General, Pomaré, Inc. (Hilo Hattie's corporate office), and Hoku Scientific, Inc. where he developed extensive contracting, project management, and procurement experience. Mike grew up in Wai‘anae (and still considers his parents' house "home") and graduated from Hawaii Baptist Academy. He earned a Bachelor of Arts in Political Science from Loyola Marymount University and earned a Juris Doctor from Loyola Law School, in Los Angeles, California.

ABSTRACT

The PRC Program's mission is "to protect and improve the quality Hawai‘i's water resources by preventing and reducing nonpoint source pollution." The PRC achieves its mission by administering the U.S. Environmental Protection Agency's Clean Water Act Section 319(h) Nonpoint Source Management Program, which provides federal grants to support the PRC and fund implementation projects that improve water quality in watersheds throughout the State. This presentation will highlight some of the PRC's implementation projects, and outline funding opportunities and challenges for potential partners.

HEER: WATER QUALITY ACTIVITIES

Fenix Grange
Hazard Evaluation and Emergency Response Office
Hawaii Department of Health

BIOGRAPHY

Fenix Grange, M.S. is the Program Manager for the Department of Health's Hazard Evaluation and Emergency Response Office. Trained an environmental toxicologist, Fenix has 18 years of combined environmental regulatory experience in Superfund as well as human and ecological toxic chemical exposure assessments. Working for the Oregon Department of Environmental Quality, she was one of two state co-managers for the Portland Harbor Superfund Site, acting as the primary tribal engagement coordinator, and initiated statewide implementation of innovative pesticide stewardship partnerships between farmers, university extension and regulators to effectively reduce off-target water quality impacts of pesticides while protecting crop quality. She was promoted to a senior science position to integrate toxic chemical hazard assessments across environmental programs. She came to HDOH in 2012 as the Supervisor of the HEER Site Discovery, Assessment and Remediation Section, and became Program Manager in 2016. In addition to overseeing Superfund and state cleanups of contaminated properties, HEER routinely provides technical and scientific support to other programs, state and local agencies on assessment and evaluation of environmental hazards.

ABSTRACT

In response to growing community concerns about possible offsite impacts of currently used pesticides on local communities and ecosystems, Hawaii's Departments of Health and Agriculture used agency special funds to design and implement a pilot study to sample surface waters and sediments state wide. We are sharing the results of the draft study with community and government stakeholders statewide so that we can begin to work together to learn more about the occurrence of currently used pesticides in non-target environments.

HAWAII DEPARTMENT OF AGRICULTURE -PESTICIDES

Greg Takeshima
Pesticides Branch, Hawaii Department of Agriculture

BIOGRAPHY

Greg Takeshima is the Supervisor for the State of Hawai'i's Department of Agriculture, Pesticides Branch, Registration and Education Sections. He has more than 11 years of combined private and public environmental experience working at Hawaiian Dredging & Construction Company, the Department of Health, Clean Water Branch, and the Department of Agriculture, Pesticides Branch. He graduated from Hilo High School, and the University of Hawai'i at Hilo where he earned a Bachelor's degree in Marine Science.

ABSTRACT

The Hawaii Department of Agriculture oversees major regulations affecting pesticide use In Hawaii. Activities include regulating the manufacture, sale, and use of pesticides in the State of Hawaii and regulating the distribution and use of pesticides to ensure safety and availability of important pesticides.

LUNCH
SPEAKER

NATIVE OYSTERS FOR WATER QUALITY IMPROVEMENT

Rhiannon Chandler-ʻIao, Esq., Executive Director and Oʻahu Waterkeeper, Waiwai Ola Waterkeepers Hawaiian Islands

BIOGRAPHY

Rhiannon "Rae" Tereariʻi Chandler-ʻĪao serves as the Executive Director and Oʻahu Waterkeeper for Waiwai Ola Waterkeepers Hawaiian Islands. She earned a B.A. in Ethnic Studies from the University of Hawaiʻi at Mānoa in 2004. After graduating from William S. Richardson School of Law in 2016 with certificates in both Native Hawaiian Rights Law and Environmental Law, she worked as a Post-J.D. Research & Teaching Fellow at Ka Huli Ao Center for Excellence in Native Hawaiian Law. Prior to attending law school, Rhiannon served as the Executive Director of the environmental non-profit organization Community Work Day Program, d.b.a. Mālama Maui Nui. While on Maui, she served as a member of the Maui County Cultural Resources Commission, the Maui Nui Marine Resource Council, and the Steering Committee of Ka Ipu Kukui Fellows Leadership Program.

ABSTRACT

Waiwai Ola Waterkeepers Hawaiian Islands, a member of Waterkeeper Alliance, is currently working with the Pacific Aquaculture and Coastal Resources Center at UH Hilo on the first project in Hawaiʻi to restore native oysters to improve water quality and clarity. Oysters are filter feeders that remove harmful pollutants including sediment, bacteria, heavy metals, PCBs, oil, microplastics, sunscreen chemicals, and nutrients from the water column. In conjunction with the native oyster restoration project, Waterkeepers will engage youth in watershed education about stormwater, wastewater, water quality, and fishing safety. The oyster restoration project is set to begin in late 2018 at select locations around Oʻahu. The project is modeled after several successful partnerships with Waterkeeper organizations on the East Coast involving the restoration of native oysters for bioremediation, including the Billion Oyster Project in New York Harbor.

Waterkeepers' second major initiative is the "Clean Water Under Our Homes" program to address Hawaiʻi's pressing cesspool issue. In partnership with the Hawaiʻi Department of Health, Waterkeepers is working to create a low-cost loan program to help residents afford to upgrade their cesspools to septic tanks or aerobic treatment units. This will reduce bacteria levels and pathogens in our water resources.

CONCURRENT SESSION A

MODELING THE ENVIRONMENTAL DRIVERS OF CORAL BLEACHING IN HAWAII: DOES IMPACTED WATER QUALITY AFFECT BLEACHING TOLERANCE?

Thomas Oliver
NOAA PIFSC, Ecosystem Sciences Division

Biography:

Thomas A. Oliver is a federal Research Ecologist at NOAA's Pacific Islands Fisheries Science Center. He has over 16 years of experience studying the physiological ecology of reef corals and coral reef ecosystems. He did his undergraduate work at Cornell University, graduated *magna cum laude* in 1998, and followed with his PhD work at Stanford University, graduating in 2009. After 3 years working as post-doc and faculty at UH Manoa, he's been with PIFSC since 2015.

Abstract:

The global coral bleaching event of 2014-2017 brought extensive bleaching and mortality to reefs of the main Hawaiian Islands. Here we present the compilation of the Hawaii Coral Bleaching Collaborative's bleaching monitoring data, collected across the main Hawaiian Islands during the peak of the 2015 bleaching event, Oct-Nov 2015. From 546 surveyed sites, estimates of bleaching prevalence varied between 0 and 95% of live coral cover pale or bleached, with a mean of 43.5% across the entire dataset. After gridding to 1 km clusters, across three depth zones, we built correlative general additive models of the drivers of exposure and bleaching susceptibility. Bleaching observed on Hawaii's reefs in the wake of the 2015 event varied along gradients of exposure to abnormally high water temperature, high benthic irradiance, and depth. These three variables alone explained 52% of the variation in the bleaching prevalence. Using the residuals of the exposure model, we generated a proxy for varying thermal susceptibility, i.e. exposure-corrected bleaching rates. This susceptibility proxy increased with increasing coastal effluent intrusion, the maximum ocean temperature from the previous year (2014), and declined with increasing thermal variability in 2015. Deliberate management actions to reduce coastal effluent intrusion on Hawaii's reefs and to consider thermally variable habitats as potential areas of low susceptibility present the best opportunity to reduce the impact of inevitable future mass bleaching events to the state's coral reefs.

DETECTING SEWAGE POLLUTION IN THE PU'AKO WATERSHED

Steven Colbert, Ph.D.
University of Hawaii at Hilo, Department of Marine Science

BIOGRAPHY

Dr. Steven Colbert is a coastal hydrologist in the Marine Science Department at UH Hilo. His current projects include examining the groundwater connections between on-site sewage treatment units and the shoreline at Puako, HI, and examining the hydrology and primary productivity of three Hawaiian fishponds in Keaukaha, HI. He has also been measuring the water quality and extent of the hydrothermal plume generated by lava flowing into the ocean in Puna. Previous work included the impact of nearshore groundwater inputs on the biologic formation of calcium carbonate at Kapoho and Honaunau.

ABSTRACT

Determining the location of sewage pollution in a watershed is important for implementing management actions to reduce pollution impacts on coral reefs. The study's goal was to identify locations of sewage pollution in the Puakō watershed on Hawaiʻi Island. To achieve this goal, sewage indicators [fecal indicator bacteria, stable nitrogen isotopes, nutrients] were measured in groundwater at high, mid-, and low elevation wells, as well as along the shoreline. Dye tracer tests, water quality, and $\delta^{15}N$ macroalgal measurements assessed water quality impairment caused by different onsite sewage disposal systems (OSDS) types. FIB concentrations along Puakō's shoreline were substantially higher than those in upslope wells and resorts' shoreline waters, with concentrations of Enterococci exceeding state standards and *Clostridium perfringens* ones indicative of non-point source sewage pollution. Positive hits for human *Bacteroides* only occurred at Puakō. $\delta^{15}NO_3^-$ were indicative of sewage pollution at Puakō, while values upslope and at adjacent resorts were indicative of soil and fertilizers. These findings confirm that sewage is largely entering the water table at Puakō. Dye was detected in front of all OSDS types, reached the shoreline within 5 h to 10 d, and each OSDS type had an example of dye reaching the shoreline in 1 d. FIB, $\delta^{15}N$ macroalgal, nutrient concentrations were also similar in front of all OSDS types. These results suggest that the underlying geology controls how fast sewage flows from the OSDS to the shoreline, not the system type. Our findings highlight the need for improved sewage treatment and collection at Puakō.

NITROGEN REDUCING TECHNOLOGIES FOR INDIVIDUAL WASTEWATER SYSTEMS

Sina Pruder, P.E.
Wastewater Branch, Hawaii Department of Health

BIOGRAPHY

Sina Pruder received her engineering degree from the University of Hawaii. She is also has her professional engineering license in civil engineering. She has worked in the Wastewater Branch for 24 years, where she is currently the Branch Chief. Wastewater Branch is responsible for regulating onsite wastewater systems (including cesspools) and water reuse in the State of Hawaii.

ABSTRACT

Nitrogen is one of the nutrients naturally found in sewage. Although nitrogen is found naturally in the environment, excess reactive nitrogen can lead to environmental and public health problems. Elevated nitrate levels in drinking water can lead to methemoglobinemia, or blue baby syndrome, where nitrate reduces the amount of hemoglobin present in the bloodstream. Nitrogen can also stimulate algae blooms, especially in coastal waters. Excess algal growth can not only be a nuisance, interfering with human activities such as swimming, boating, and fishing, but algae that creates brown or red tides in coastal waters can produce toxins that accumulate in filter feeding shellfish such as oysters and clams making them potentially lethal if consumed. A variety of technologies have been developed for the purpose of reducing nitrogen in wastewater treatment systems.

DISCUSSION SESSION
HAWAII'S CESSPOOL STRATEGY – WHERE DO WE GO FROM HERE?
Funding and Implementing Cesspool Upgrades – "up to 2050"

- The Legislature has taken important actions to address Hawaii's cesspools, supported by DOH.
- Cesspools have significant impact on the quality of drinking water, general water quality, the health of our reefs, and the health of Hawaii's residents and visitors.
- Through federal regulation, the USEPA is already working with operators in the state to address large-capacity cesspools, and we must now focus on addressing smaller-scale domestic use of cesspools statewide.
- During Legislative session 2017, Act 125 was passed, requiring the replacement of all cesspools by 2050 and directing DOH to evaluate cesspools in the state, develop a prioritization method, and work with the Department of Taxation on possible funding options to reduce the financial burden on homeowners.
- The report identifies 14 areas in the state where an evaluation of data on hand indicates greatest need for action. As we gather more data in the future, the areas prioritized may change.
- During Legislative session 2018, Act 132 was passed to establish a Cesspool Conversion Working Group to develop a comprehensive plan for the conversion of all statewide cesspools by 2050.
- Act 132 identifies 14 tasks that need to be evaluated by the working group.
- Provides a $1M appropriation to retain the services of a consultant to assist the work group with the evaluation of these 14 specific task items.

Tasks required under Act 132 related to financing of cesspool upgrades

- Develop a long-range, comprehensive plan for cesspool conversion statewide of all cesspools by 2050, to be known as the cesspool conversion plan.
- Examine financing issues and the feasibility of various mechanisms, including grants, loans, tax credits, fees, special assessment districts, requirements for conversion at point of sale, and any other appropriate mechanisms for accomplishing and funding cesspool conversion, or any combination of these mechanism.
- Consider owners' ability to pay for cesspool conversions, and, especially how assistance can be provided for lower-income homeowners.
- Consider the most cost-effective approach to cesspool conversion.

CONCURRENT
SESSION B

GROUNDWATER MONITORING STATUS REPORT

Daniel Chang
Safe Drinking Water Branch, Hawaii Department of Health

BIOGRAPHY

Daniel Chang is an Environmental Health Specialist with the Hawaii Department of Health's Safe Drinking Water Branch. He has over 30 years of experience in hazardous waste, groundwater and drinking water quality and protection programs. Mr. Chang received his Bachelors degree from the University of Hawaii at Manoa majoring in Chemistry. His duties and responsibilities at the Safe Drinking Water Branch includes: oversight/supervision of the Monitoring & Analyses Section and the Groundwater Protection Program. He also provides guidance/assistance to the Wellhead/Source Water Assessment and Protection Program.

ABSTRACT

As part of the Hawaii Groundwater Protection Strategy, the Groundwater Protection Program must prepare a Groundwater Monitoring Status Report every four (4) years.

Goal 1: Monitor and assess groundwater quality.

- Objective 3: Every four years, generate a Groundwater Status Report which provides a review, analysis, and summary of groundwater monitoring data to understand contamination trends and sources of contamination. The Report shall include a list of proposed future monitoring of contaminants of concern with rationale and priorities based on severity of public health impacts.

This presentation will provide an overview of the history of groundwater monitoring, summarize current monitoring projects, and propose future monitoring of potential contaminants of concern.

IMPORTANCE OF WATERSHED PROTECTION TO GROUNDWATER

Katie Ersbak
Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources

BIOGRAPHY

Katie Ersbak is a Watershed Planner with the State of Hawai‘i, Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW). She has B.A. in Urban Studies and Planning from the University of California, San Diego and a Master’s Degree in Urban and Regional Planning from the University of Hawai‘i at Mānoa. Katie began her career at DLNR in 2011 with the Commission on Water Resource Management. Her experience working on fresh water issues helped set the stage for a position with DOFAW where she currently coordinates statewide protection efforts for Hawaii’s native forests and mauka watersheds working closely with groups like the Watershed Partnerships. As the head of DOFAW’s Watershed Partnerships Program, Katie administers funding to support the partnerships and other groups in their efforts to control ungulates, stop the spread of invasive weeds, build fences and engage with policy makers.

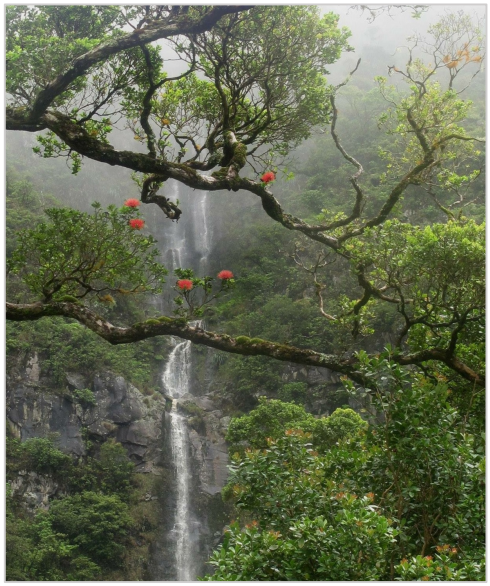
ABSTRACT

Hawaii's native forests absorb rain and cloud moisture across millions of acres - and are the source of Hawaii's fresh water. At the same time, they help reduce erosion that can impact water quality and damage coral reefs. For over a century, the public-private partnerships have managed mauka forests by preventing the advance of invasive plants, animals and disease. This presentation will discuss the approaches to mauka watershed management in Hawai`i and the important role of the State's Division of Forestry and Wildlife and Watershed Partnerships in helping safeguard fresh water resources.

CO-PRESENTER

Cheyenne Perry was raised under the blazing sun of Waianae on Oahu where he developed an appreciation for cool mountain waters and plants that were green. After some time in the military he moved to the Island of Hawaii to attend school at UH Hilo developing a background in marine science and conservation biology while making a home there, the forests of Mauna Kea beckoned. Today he is the Coordinator for the Mauna Kea Watershed Alliance, one of ten watershed partnerships statewide, helping to coordinate watershed management across partnership lands totaling 343,000 acres.

Our Forests. Our Life. Watershed Protection by 2030.



Hawai'i is home to unique ecosystems that are in need of our protection. Photo Credits (from left to right): Christian Kahahawai, Nate Yuen, Ryan Chang.

OVERVIEW

The Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) is responsible for managing over 1 million acres of public land across the state. DOFAW managed lands include forested watersheds that supply Hawaii's drinking water, unique native ecosystems found no where else in the world and cultural resources. Protection is needed in order to safeguard these invaluable resources in the face of threats such as invasive species and climate change.

COMMITMENT AND GOALS

In response to these threats, the State is committed to protect 30% (253,000 acres) of Hawaii's highest priority watershed forests by 2030. Of the 843,000 acres identified as priority watershed across the State, only about 140,000 (17%) are currently protected.

Invasive plants and animals are the biggest threats to the health of Hawaii's native ecosystems. The State, with the help of partners, works to lessen the impact of these threats by removing ungulates (hooved animals such as pigs, goats, deer) from priority watershed areas, controlling the spread of invasive weeds, planting native trees to restore badly degraded areas, constructing fire breaks, acquiring new land for hunters and hikers, and building fences to keep out ungulates.

There have been over 40,000 acres of new fenced watershed areas in the last five years. However, more funding is needed to support the long-term management and maintenance of these newly protected areas. While our remaining forests are largely healthy and functioning, the State lacks the capacity to effectively manage and maintain that health in light of advancing threats and insufficient sustainable funding to support the staff and programs required to achieve the level of protection that is needed. DOFAW works to leverage non-State funds and is developing innovative financing mechanisms to help fill this gap.

EXPECTED BENEFITS

- Protect the source of Hawaii's fresh water - our native forests.
- Reduce erosion that muddies our streams and beaches.
- Prevent the extinction of animals and plants found nowhere else in the world.
- Increase carbon storage by protecting forests and planting native trees.
- Preserve cultural practices and sites in the wao akua.
- Combat the spread of invasive plants and pests, including diseases like Rapid 'Ōhi'a Death (ROD).

DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE

DIVISION OF FORESTRY AND WILDLIFE
1151 Punchbowl Street, Room 325 | Honolulu, HI 96813

Watershed Partnerships assist the State manage and protect native forests. Their ability to work on public and private lands enables landscape-scale protection across thousands of acres. Photo Credits (from left to right): Kirsty Gallaher and Ryan Chang.

DOFAW PROGRAM PRIORITIES

- Water
- Fire & Forest Health
- Native Ecosystems
- Forestry
- Recreation

PARTNERS

Many agencies and organizations help supplement State funding for watershed protection. These include:

- 10 Watershed Partnerships*
- U.S. Fish & Wildlife Service
- USDA Natural Resources Conservation Service
- Hawai'i Department of Health
- County Departments of Water Supply
- The Nature Conservancy
- U.S. Forest Service
- Kamehameha Schools
- And many more private and public organizations

NEED FOR WATERSHED PROTECTION

- 'Ōhi'a make up 80% of our watersheds. Our water supply is dependent on these native 'ōhi'a forests.
- Eroding soil caused by ungulate damage can smother coral reefs. Forests can reduce erosion by 90%.
- Studies by UH estimate the value of O'ahu's Ko'olau forests to provide fresh water and other ecosystem services at $14 billion.
- A fraction of tourism dollars is spent to protect the forests that provide the aesthetic backdrop of our visitor industry.

BUDGET

Watershed protection is estimated to cost $11 million per year. This includes the capital improvement project cost to build fences and general funds that support the removal of ungulates and weeds from priority areas.

*State funding for the State's Watershed Partnerships Program are typically matched 1:1.
In FY17 $4.1 million of non-State match was contributed to the Watershed Partnerships Program.

CONTACT PERSON

Emma Yuen
Native Ecosystems Program Manager
Division of Forestry and Wildlife, DLNR
Emma.Yuen@hawaii.gov
(808) 587-4170

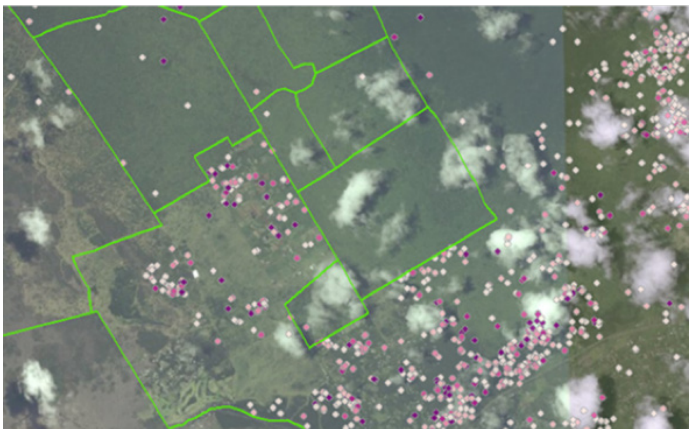
RAPID ʻŌHIʻA DEATH RESPONSE

DEPARTMENT OF LAND
AND NATURAL RESOURCES

ROD infected forest.

ʻSUMMARY

Rapid ʻŌhiʻa Death (ROD) is a fungal disease that has killed hundreds of thousands of native ʻōhiʻa (*Metrosideros polymorpha*) trees and affected more than 135,000 acres of forest on Hawai'i island. While much of the affected area has only scattered dead trees, some areas have lost as much as 90% of healthy canopy trees. The expansion of ROD on Hawai'i island poses the single greatest threat to Hawaii's main native tree species and watersheds, not just on Hawai'i Island, but throughout the state. DLNR is leading the multiagency response on Hawai'i Island, as well as carrying out early detection surveys on other islands.

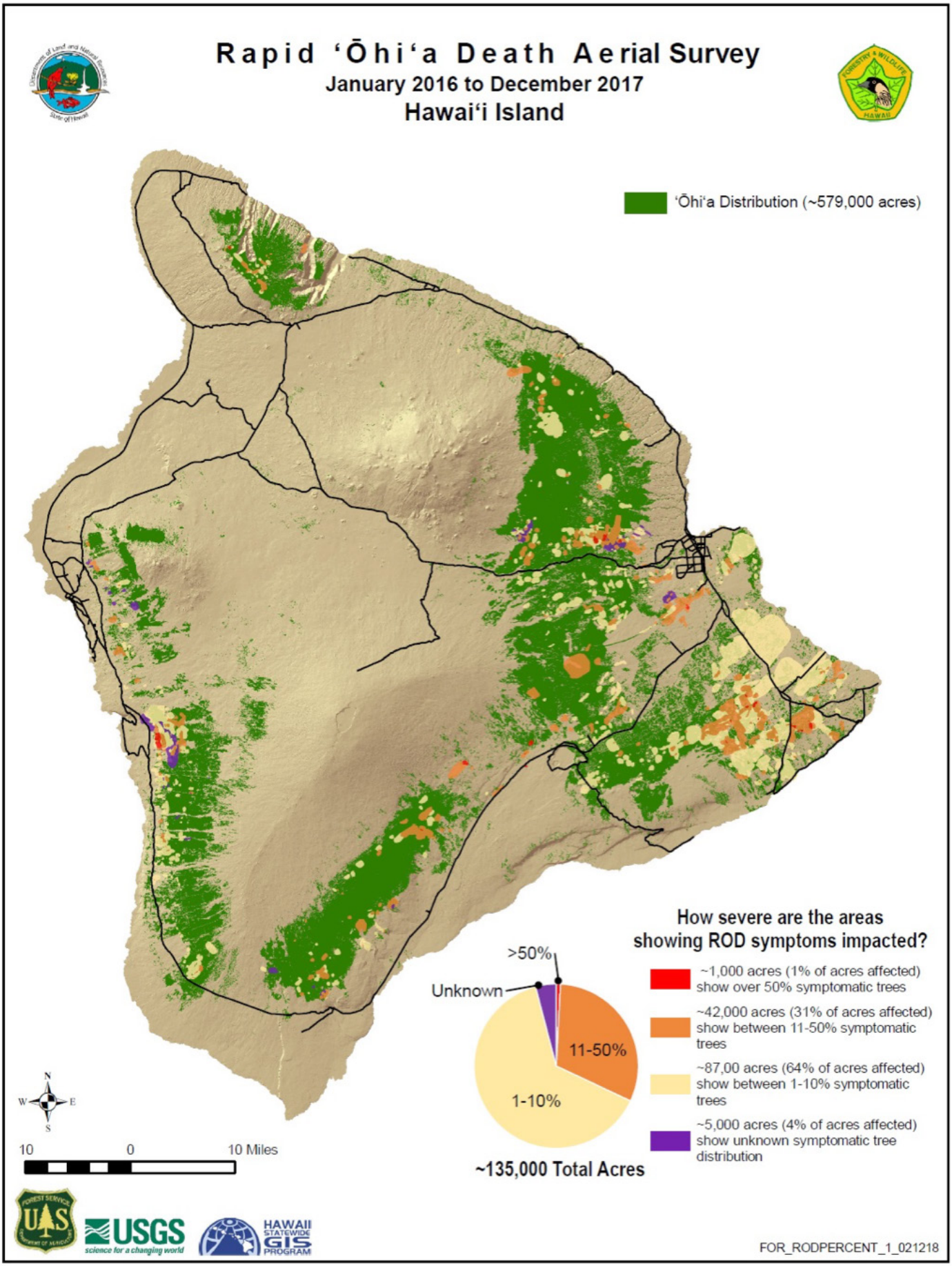


Fences (green lines) appear to protect forests from ROD near Volcano, Hawai'i Island.

THREAT TO OUR WATERSHEDS

Our native ʻōhiʻa forests are vital to aquifer recharge and help ensure an adequate supply of fresh water for drinking, agriculture, irrigation, and other uses. In addition to ROD monitoring and research, investments in watershed management and fencing projects are an important part of rapid response. Intact native forests have a much higher capacity to withstand impacts from ROD than unprotected areas. By investing money in watershed management and protection projects such as fencing, the State can ensure the perpetuation of healthy forests – more resilient to disease and able to continue providing clean, fresh water.

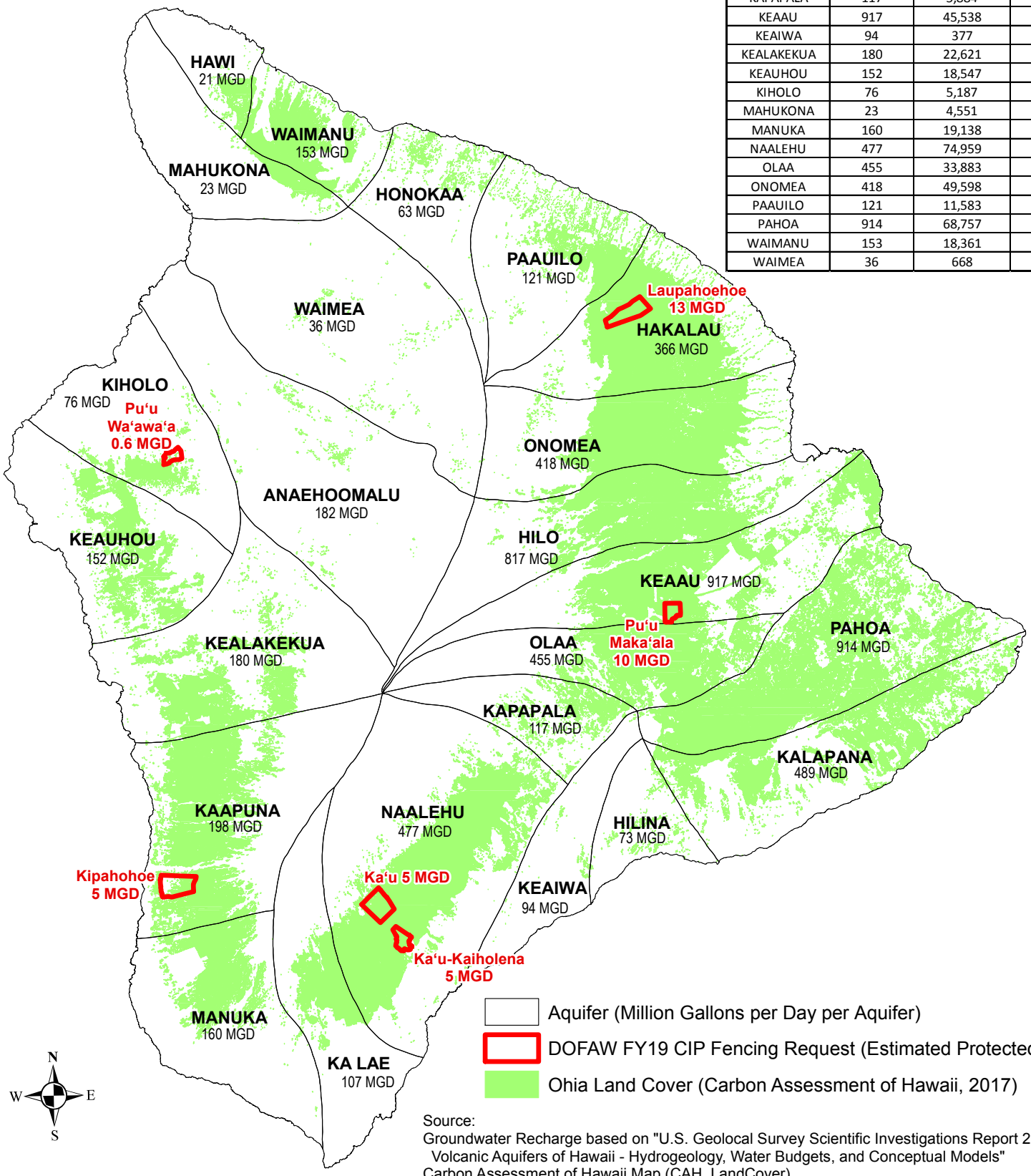
As shown on page 3 below, ʻōhiʻa forests are the dominant vegetation across much of the island's important recharge areas. **In fact, more than 1/3 of recharge on Hawai'i Island is associated with ʻōhiʻa forest**. Forests killed by ROD will be replaced by other vegetation, in many cases, invasive trees such as strawberry guava. Although we don't know how much recharge will be reduced by the conversion of ʻōhiʻa forests to non-native vegetation, research shows that strawberry guava trees evaporate 27-53% more water than native forests, causing extensive water loss (Giambelluca et al., 2008). In East Hawai'i, non-native vegetation has already reduced estimated groundwater recharge by 85 million gallons a day (Engott, 2011). More research is needed to understand the hydrology of ʻōhiʻa forests and quantify impacts of ʻōhiʻa forest replacement on water recharge.


Rapid ʻŌhiʻa Death Aerial Survey
January 2016 to December 2017
Hawaiʻi Island
ʻŌhiʻa Distribution (~579,000 acres)
How severe are the areas showing ROD symptoms impacted?
>50%
Unknown
11-50%
1-10%
~1,000 acres (1% of acres affected) show over 50% symptomatic trees
~42,000 acres (31% of acres affected) show between 11-50% symptomatic trees
~87,00 acres (64% of acres affected) show between 1-10% symptomatic trees
~5,000 acres (4% of acres affected) show unknown symptomatic tree distribution
~135,000 Total Acres
N
W
E
S
10
0
10 Miles
USGS
science for a changing world
HAWAII STATEWIDE GIS PROGRAM
FOR_RODPERCENT_1_021218

Rapid ʻŌhiʻa Death and Groundwater Recharge

Hawaii Island

AQUIFER	Total MGD of Aquifer	Ohia Acres w/in Aquifer	Ohia MGD w/in Aquifer
ANAEHOOMALU	182	973	0.6
HAKALAU	366	53,986	229
HAWI	21	3,402	7
HILINA	73	1,137	2
HILO	817	42,955	424
HONOKAA	63	2,133	2
KA LAE	107	13,728	20
KAAPUNA	198	48,196	82
KALAPANA	489	34,661	124
KAPAPALA	117	5,884	14
KEAAU	917	45,538	388
KEAIWA	94	377	0.04
KEALAKEKUA	180	22,621	30.7
KEAUHOU	152	18,547	27.7
KIHOLO	76	5,187	2.8
MAHUKONA	23	4,551	9.5
MANUKA	160	19,138	27.6
NAALEHU	477	74,959	216.1
OLAA	455	33,883	242.4
ONOMEA	418	49,598	236.6
PAAUILO	121	11,583	29.2
PAHOA	914	68,757	418.2
WAIMANU	153	18,361	82
WAIMEA	36	668	0.1



Source:
Groundwater Recharge based on "U.S. Geolocal Survey Scientific Investigations Report 2015-5164: Volcanic Aquifers of Hawaii - Hydrogeology, Water Budgets, and Conceptual Models"
Carbon Assessment of Hawaii Map (CAH_LandCover)
USGS, 2017
Aquifer, DLNR, 2014

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03/16/2018

PROTECTING HAWAII'S GROUNDWATER THROUGH COORDINATION and COLLABORATION WITH OTHER AGENCIES & OUTREACH and EDUCATION

The Hawaii Department of Health (DOH) Groundwater Protection Strategy was finalized in June 2017. The Safe Drinking Water Branch will present the three goals of the strategy and the related objectives.

Goal 1: Monitor and assess groundwater quality.
Goal 2: Identify and prioritize groundwater contaminations threats.
Goal 3: Mitigate priority contamination threats and prevent contamination.

Meeting Goal 3 of the Hawaii Groundwater Protection Strategy involves multiple DOH branches and offices: Safe Drinking Water Branch (GW106/DWSRF 15%), Wastewater Branch (CWSRF), Clean Water Branch (SW106), Solid & Hazardous Waste Branch (SHWB), Hazard Evaluation and Emergency Response Office (HEER), as well as other agencies, organizations and stakeholders.

Outreach and Education is also critical to protecting our groundwater resources. What message are we presenting and who do we need to present this to.

CONFERENCE EVALUATION

2018 Joint Government Water Conference
"Protecting Hawaii's Groundwater"
Courtyard by Marriott King Kamehameha's Kona Beach Hotel
Kailua-Kona, Hawaii
August 21, 2018

CONFERENCE EVALUATION FORM

1. How much experience do you have working in water/wastewater industry program areas?

___ 0-1 years	___ 2-5 years	___ 5-10 years	___ 10-20 years	___ 20+ years

2. Which water industry area(s) do you work in? (Check all that are applicable)

___ Drinking Water ___ Wastewater ___ Water Quality

___ Water Resources ___ Water Protection ___ Watershed Management

___ Other (specify): _____

3. How would you rate the overall conference?

____ Excellent	____ Good	____ Adequate	____ Poor

4. What did you like about the conference? _____

_____

_____

5. What did you dislike about the conference? _____

_____

_____

6. How do you rate the presentation of technical information (was it presented in an understandable and interesting manner)?

____ Excellent	____ Good	____ Adequate	____ Poor

7. Did this conference meet your expectation?

____ Yes	____ No

Comments: _____

_____

8. Have you attended any of the previous Joint Government Water Conference(s)?

Please turn over for more questions. Thanks.

___ Yes ___ No If Yes, would you rate this conference as: BETTER WORST

9. In the future, would you attend this type of conference again?

____ Yes	____ No

Comments: _____

_____

10. In April 2015, the Hawaii Department of Health (DOH) implemented a Nutritional Wellness Policy that committed us to provide a safe, healthy, and productive environment for its employees and members of the public using its facilities or attending a DOH sponsored event. The adoption of this policy shall ensure that healthy choices are available whenever food and beverages are purchased with state or federal funds for DOH meetings, conferences, and other DOH sponsored events throughout the state. Do you think that the food and beverages served at today's conference provided you with a healthy choice or not.

_____ YES _____ NO If NOT (please explain) _____
_____
_____

11. Are there aspects of the conference that you believe should have greater (or less) emphasis?

_____

_____

12. Do you have any suggestions on how the conference could be improved?

_____

_____

13. Do you have any suggestions for topics for future conferences?

_____

_____

Thank you for attending the 2018 Joint Government Water Conference and for completing this evaluation form. Your comments will help us to better plan future conferences.

OPTIONAL:
Name: _____