CESSPOOL CONVERSION WORKING GROUP INFORMATIONAL BRIEFING

Tuesday, February 21, 2023

AGENDA

- Background and Overview
- Technology Study
- Data and Prioritization
- Finance Study
- Final Report Recommendations

BACKGROUND AND OVERVIEW

- The Cesspool Conversion Working Group (CCWG) issued their Final Report to the Legislature recommending ways to facilitate the upgrading of 83,000+ cesspools in Hawaii.
- The Department of Health established the CCWG as authorized by the Legislature based on Act 132 of Session Law Hawaii 2018.
- Purpose of the CCWG was to develop a long-range comprehensive plan for cesspool conversion statewide for all cesspools by 2050.
- The CCWG spent four (4) years working to tackle this challenging issue with the first meeting held on September 3, 2018.

CCWG MEMBERS

1	Dr. Elizabeth Char, Chair	Director, Department of Health
2	Edward (Ted) Bohlen	Representative of the public
3	Stuart Coleman	Formerly Surfrider Foundation, WAI
4	Charlene Lani Fernandez	Bank of Hawai‘i
5	Ken Hiraki	Hawai’i REALTORS
6	Troy Tanigawa	Wastewater Division, County of Kaua‘i
7	Dr. Roger Babcock	Director, City and County of Honolulu, Department of Environmental Services
8	Ramzi Mansour	Director, County of Hawai‘i, Department of Environmental Management
9	Dr. Darren T. Lerner	Director, University of Hawai‘i Sea Grant College Program and the Pacific Islands Climate Science Center
10	Representative Nicole Lowen	State of Hawai‘i House of Representatives
11	Kenneth Wysocki	USEPA Region 9
12	Eric Nakagawa	Director, County of Maui, Department of Environmental Management
13	Erica Perez	Coral Reef Alliance
14	Sina Pruder	Wastewater Branch, Department of Health
15	Dr. Kawika Winter	Manager, He‘eia National Estuarine Research Reserve, Hawai‘i Institute for Marine Biology
16	Michael Mezzacapo	University of Hawai‘i Water Resources Research Center

ACT 132 OBJECTIVES

- Act 132 had 15 objectives that had to be evaluated by the CCWG.
- The CCWG reviewed the objectives and placed them in three categories: **Finance, Technology, and Data Prioritization.**
- The CCWG contracted Carollo Engineers to study and provide reports on the Finance and Technology related to the objectives.
- The CCWG contracted the University of Hawaii to evaluate the 2017 data prioritization report and develop a new data prioritization method and tool to prioritize the risk of cesspools to human health and the environment.

Hawaii County Council Briefing for the

Cesspool Conversion Technologies Research

February 21, 2023

// Agenda

01 Conversion Options

02 Findings and Recommendations

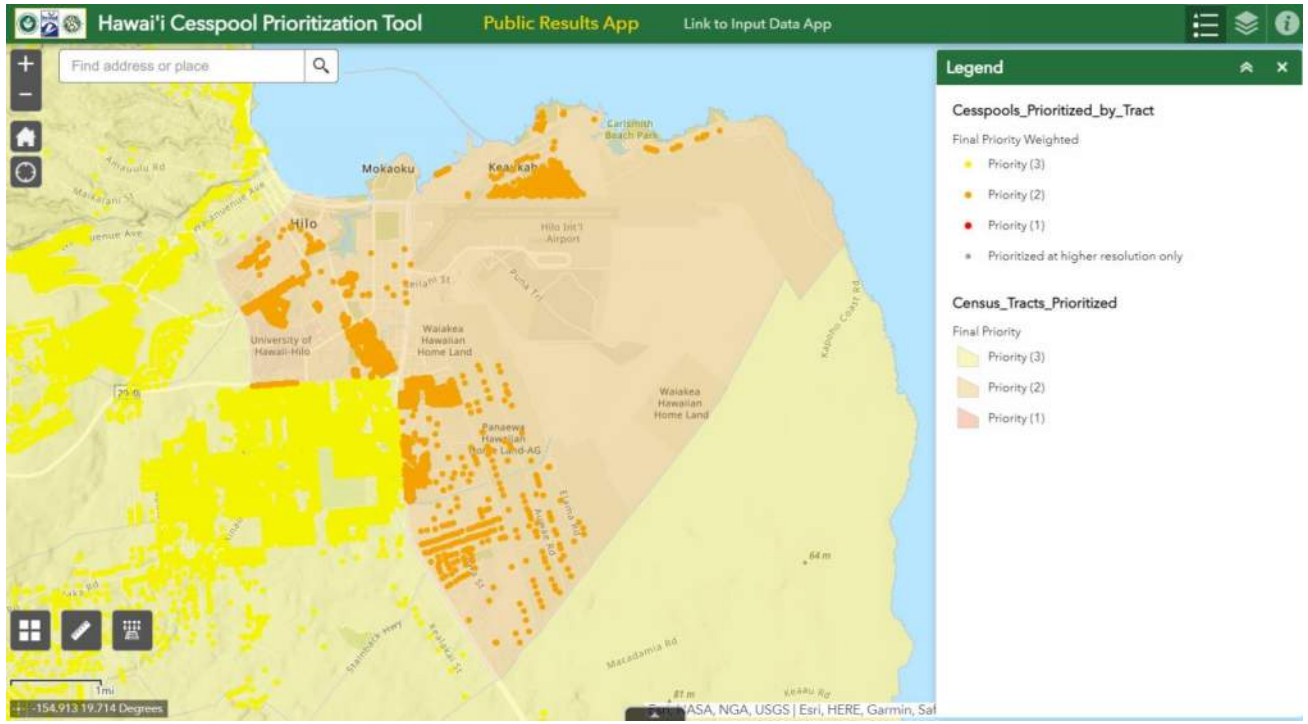
Conversion Options

// Most likely conversion options for Hawaii County

- Expansion of centralized sewer service areas
  - Evaluated in Facilities Plans
- Decentralized systems
  - Potential conversion option for clustered systems that cannot be feasibly connected to centralized systems
- Individual wastewater systems
  - Conversion technology is dependent onsite conditions

// Conversion considerations
Centralized sewers

- Proximity to existing collection system
- Feasibility of extending the collection system
- Available capacity at the wastewater treatment plant
- Cost of upgrades and sewer fees



// Benefits and challenges of centralized systems

Benefits

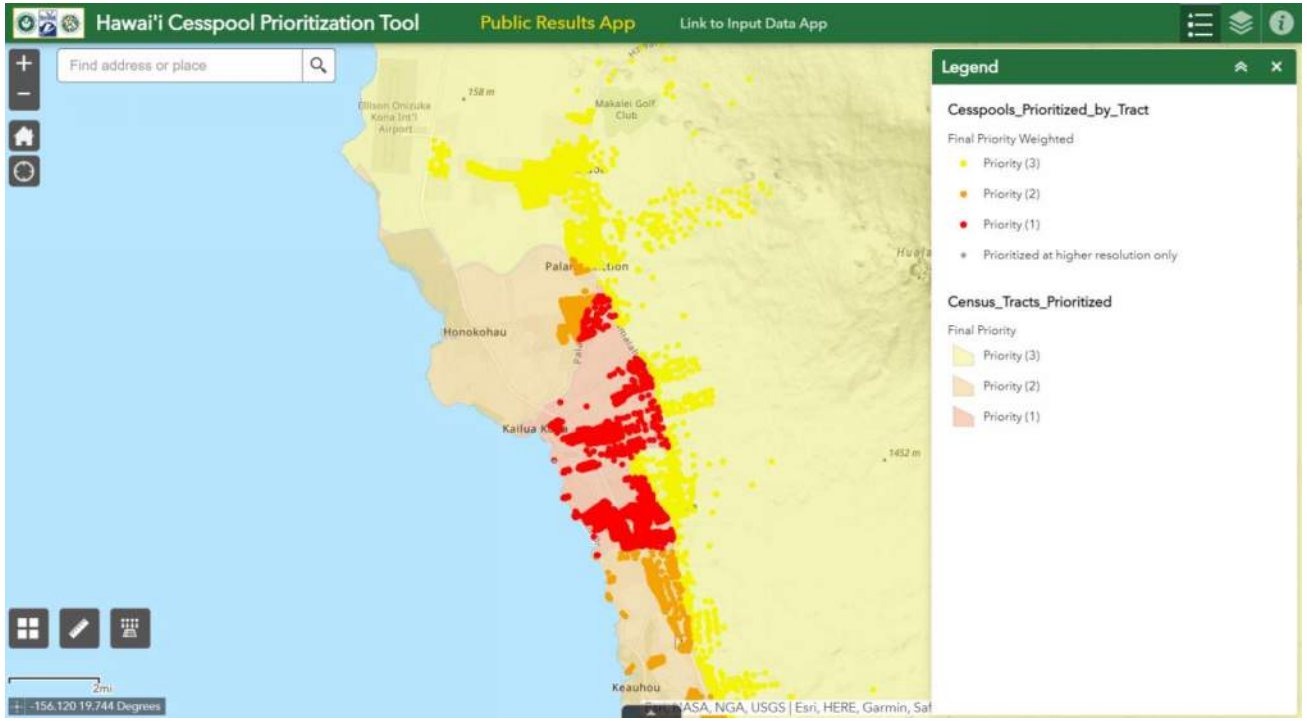
- Increase customer base and revenues
- Reduce use of potable water and increase recycled water use
- Meet design requirements of existing WWTPs
- Better environmental protection
- Achieve environmental justice goals
- Potential for rapid conversions
- Homeowners will not have to operate and maintain an individual system
- Potential to reduce the burden of conversions by limiting scope to sewer lateral only

Challenges

- County would need to expand sewer system
- Cost to the County could be significant, but can be financed/recovered over time
- County requires staff/support to implement projects

// Conversion considerations
Decentralized systems

- Number of cesspools and density
- Feasibility of constructing a collection system
- Effluent disposal options
- Biosolids handling options
- Cost of upgrades and sewer fees



// Benefits and challenges of decentralized systems

Benefits

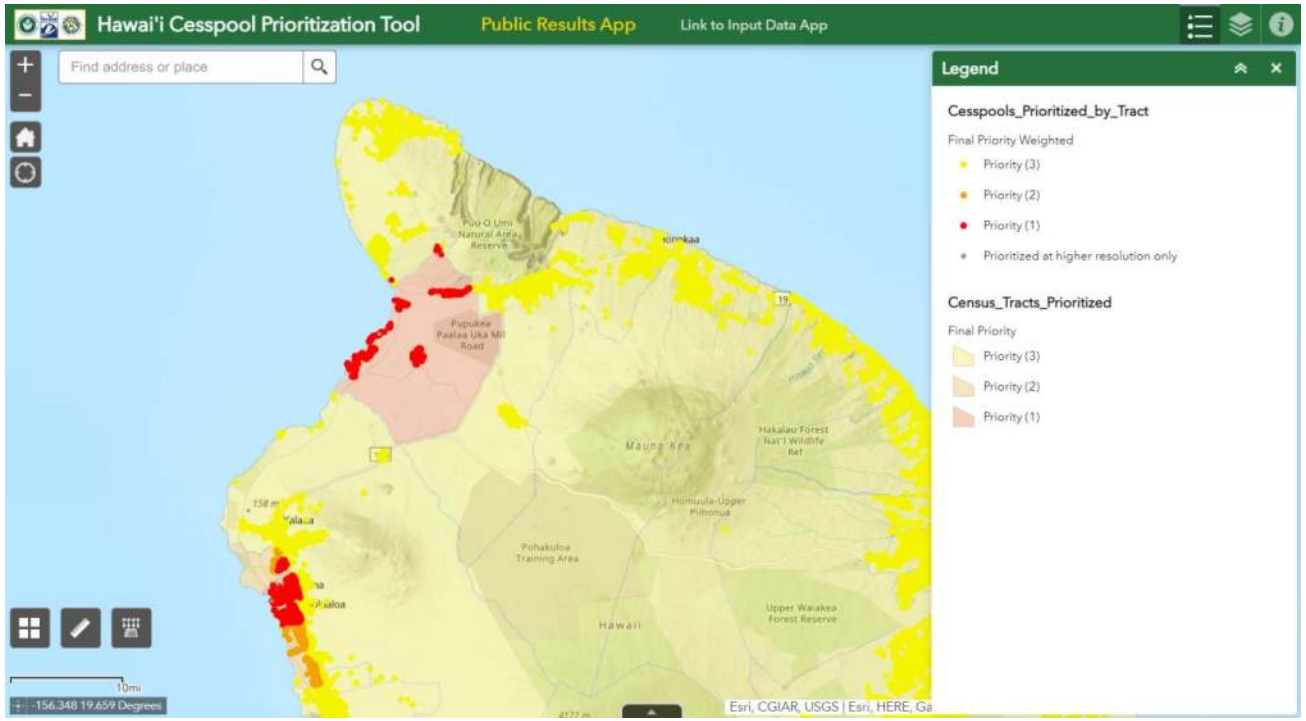
- Potential for rapid conversions
- Reducing burden on homeowners to hire engineers and contractors independently
- Ensure proper operations and ongoing maintenance by licensed operators
- Broaden range of funding opportunities

Challenges

- Need for neighborhood-level coordination
- Need for licensed operators
- Land/space requirements

// Conversion considerations
Individual wastewater systems

- Type of technology and approval status
- Terrain
- Cost to owner can be significant
- Owner is responsible for ongoing maintenance and operations



// Examples of individual systems
"Temporary systems"

- Lower level of treatment: Septic tank and drain field
- Higher level of treatment: Aerobic treatment unit, other nutrient removal technologies

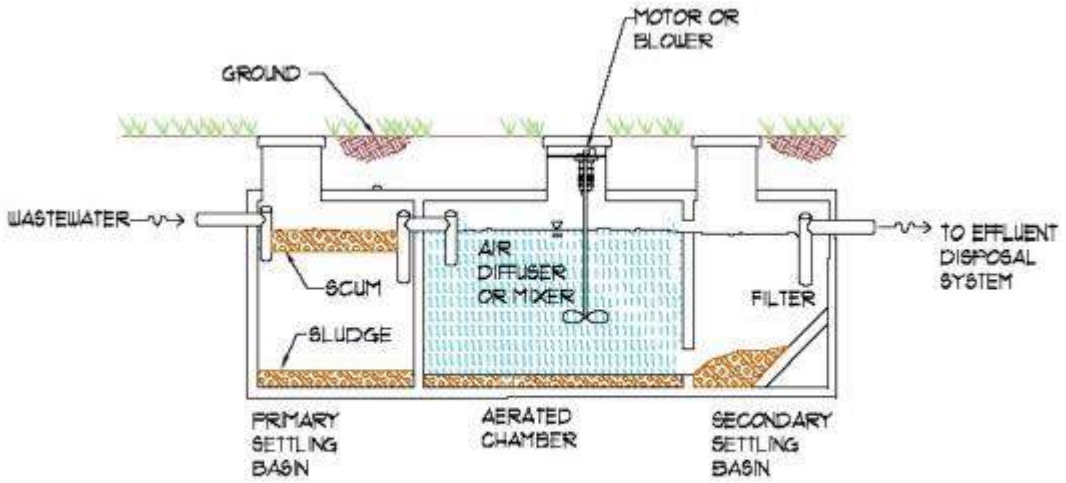


FIGURE 3. Schematic of Suspended-Growth Flow-Through ATU.
Aerobic treatment units can remove ammonia (nitrification) and nitrate (denitrification) providing better nitrogen treatment than a septic tank.

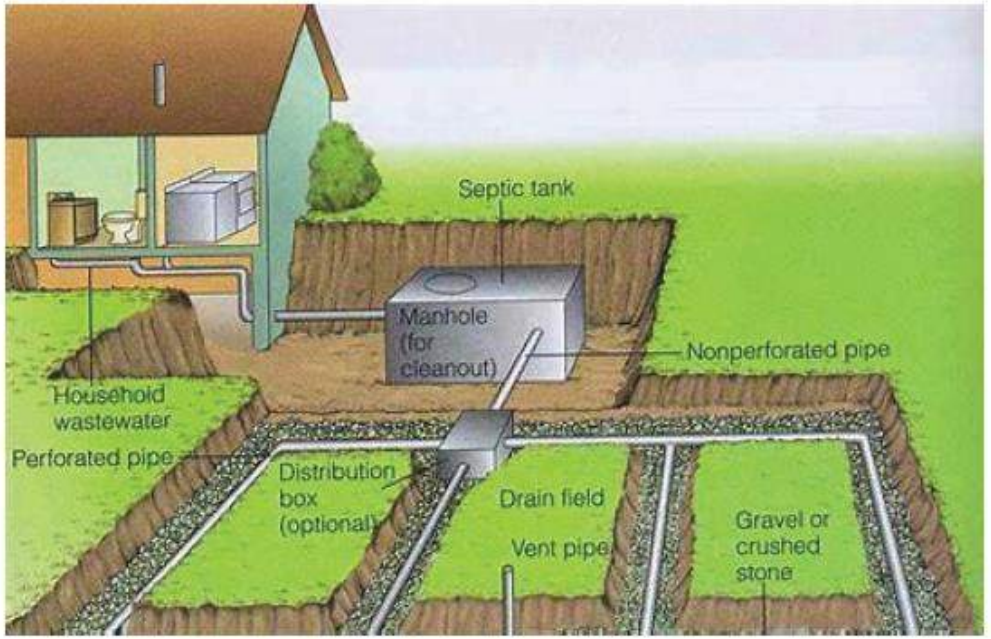


FIGURE 4. Trench Absorption System.
Absorptions systems are a common, cost-effective disposal option for onsite systems but do have a minimum space requirement.

// Benefits and challenges of individual wastewater systems

Benefits

- Potentially a relatively simple conversion if a high level of treatment isn't required (e.g., septic tank + drain field)

Challenges

- Owner must hire licensed engineer and contractor
- Cost must be borne by homeowner and financial support is required for many
- If higher level of treatment is needed, a more complex system is required
- Owner must operate and maintain their system
- Property constraints relative to effluent disposal options
- May not achieve environmental justice goals

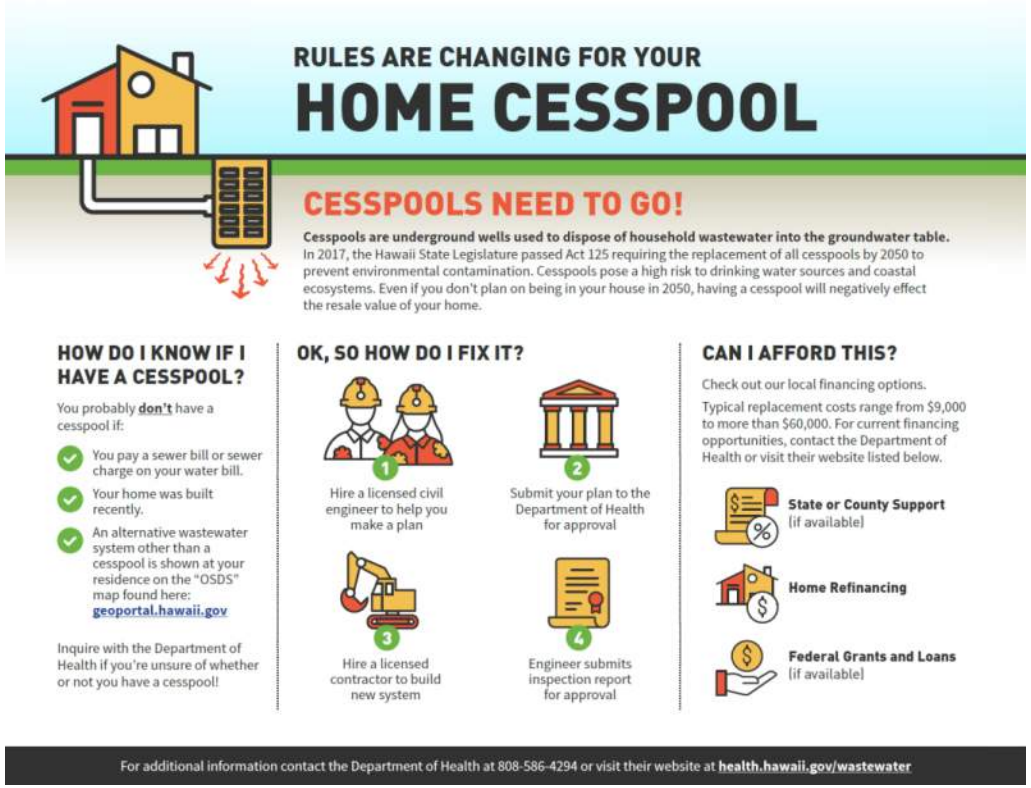
Findings and Recommendations

// Summary of findings and recommendations

- **Develop better understanding of onsite treatment options**
  - Allowable “density” of septic tank systems or numeric limits for total nitrogen
- **Develop a coordinated strategy for methods of conversions**
  - What cesspools can be easily connected to existing sewers?
  - What cesspools can be connected to extended or new sewer systems?
  - Feasibility of decentralized treatment for high-density, high-priority cesspool areas.

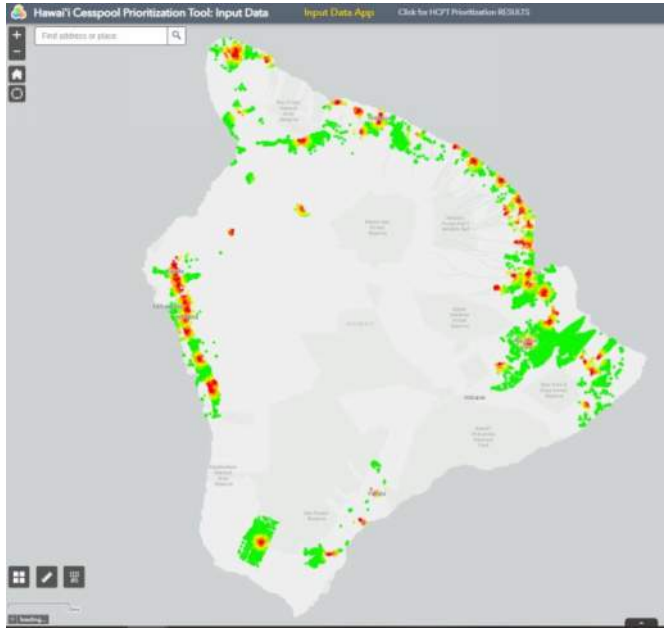
// Summary of findings and recommendations (cont'd)

- **Staffing/training/workforce development**
  - Professional staff
  - Contractors
  - Operators
- **Public outreach, education, and homeowner tools**
  - Develop educational resources
  - Educate on conversion options
  - Facilitate access to engineers, contractors, and operators with applicable experience
  - Provide guidance on financial support or funding options



The 2022 Hawai‘i Cesspool Hazard Assessment & Prioritization Tool

Chris Shuler & Michael Mezzacapo
University of Hawaii at Manoa SeaGrant College Program &
Water Resources Research center



Objectives

1. Identify a comprehensive list of factors to inform the new prioritization assessment;
2. Categorize previously uncategorized (Priority Level 4) cesspools;
3. Provide DoH/CCWG recommendations based on new findings where appropriate;
4. Develop a scientifically unbiased and objective framework to rank all cesspools on the 4 main islands
5. Present results through a web-based tool to view prioritization levels and input data

Process

1) Updated statewide cesspool inventory

2) Curated statewide risk-factor data

3) Developed reproducible, scientifically objective code-based calculation framework

4) Quantified 'risk' through geospatial association with each factor

5) Workshops with a panel of experts to help weight factors

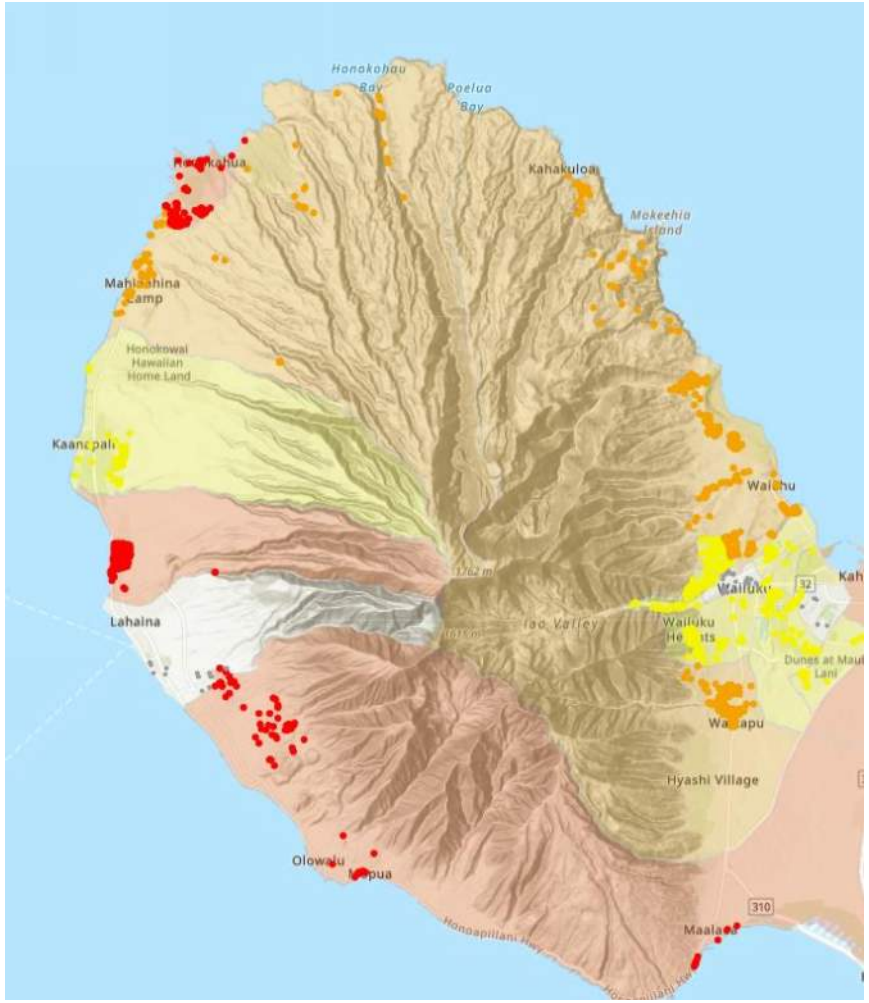
6) Synthesized all data into single prioritization score for each cesspool

1. Distance to coastline;
2. Distance to streams and wetlands;
3. Distance to drinking water wells;
4. Well capture zones;
5. Sea level rise zones;
6. Precipitation;
7. Depth to groundwater;
8. Cesspool density;
9. Soil characteristics;
10. Groundwater flow paths;
11. Coral cover;
12. Fish biomass/recovery potential;
13. Beach user-days;
14. Proximity to lifeguarded beach;
15. Coastal ocean circulation

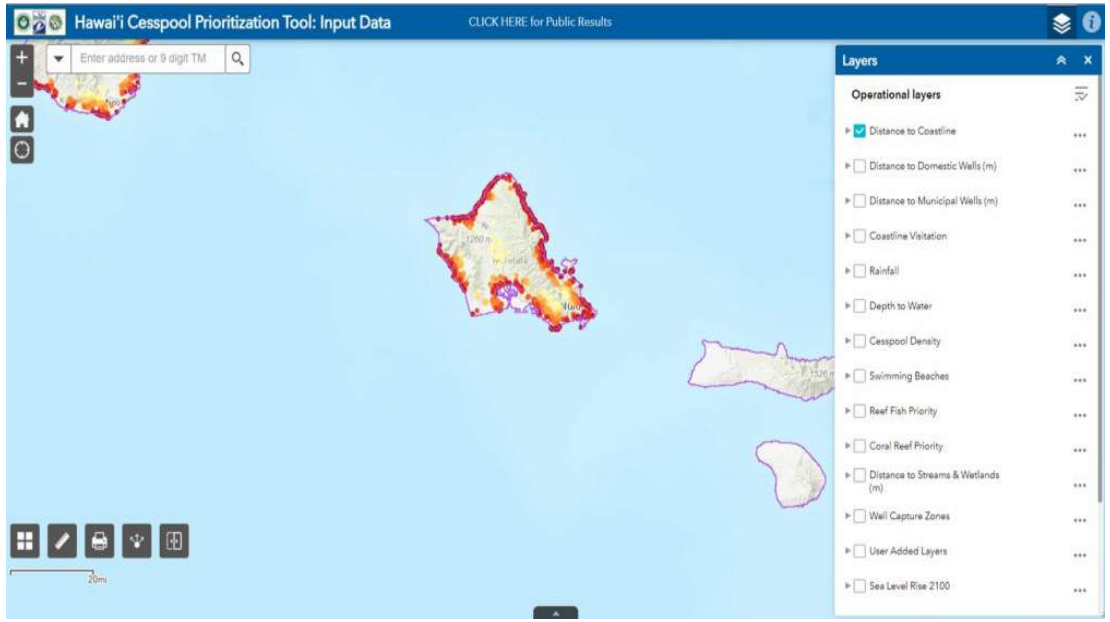
Prioritization Results

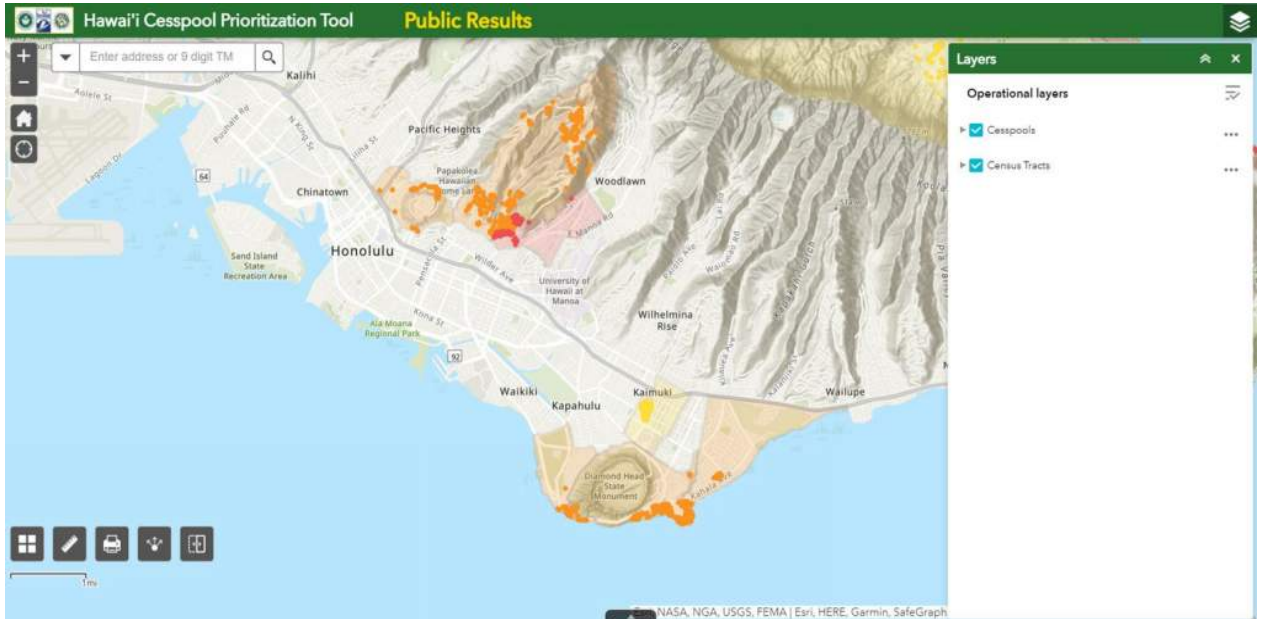
Threshold based binning of all census tracts into three simple categories

(1) Highest Priority Cesspools	(2) Medium Priority Cesspools	(3) Lower Priority Cesspools
Top 25%	75 to 50%	Bottom 50%
13,821 units	12,367 units	55,237 units



Web Application Tools





[DOH Input Data Tool]

[Public Results Map]

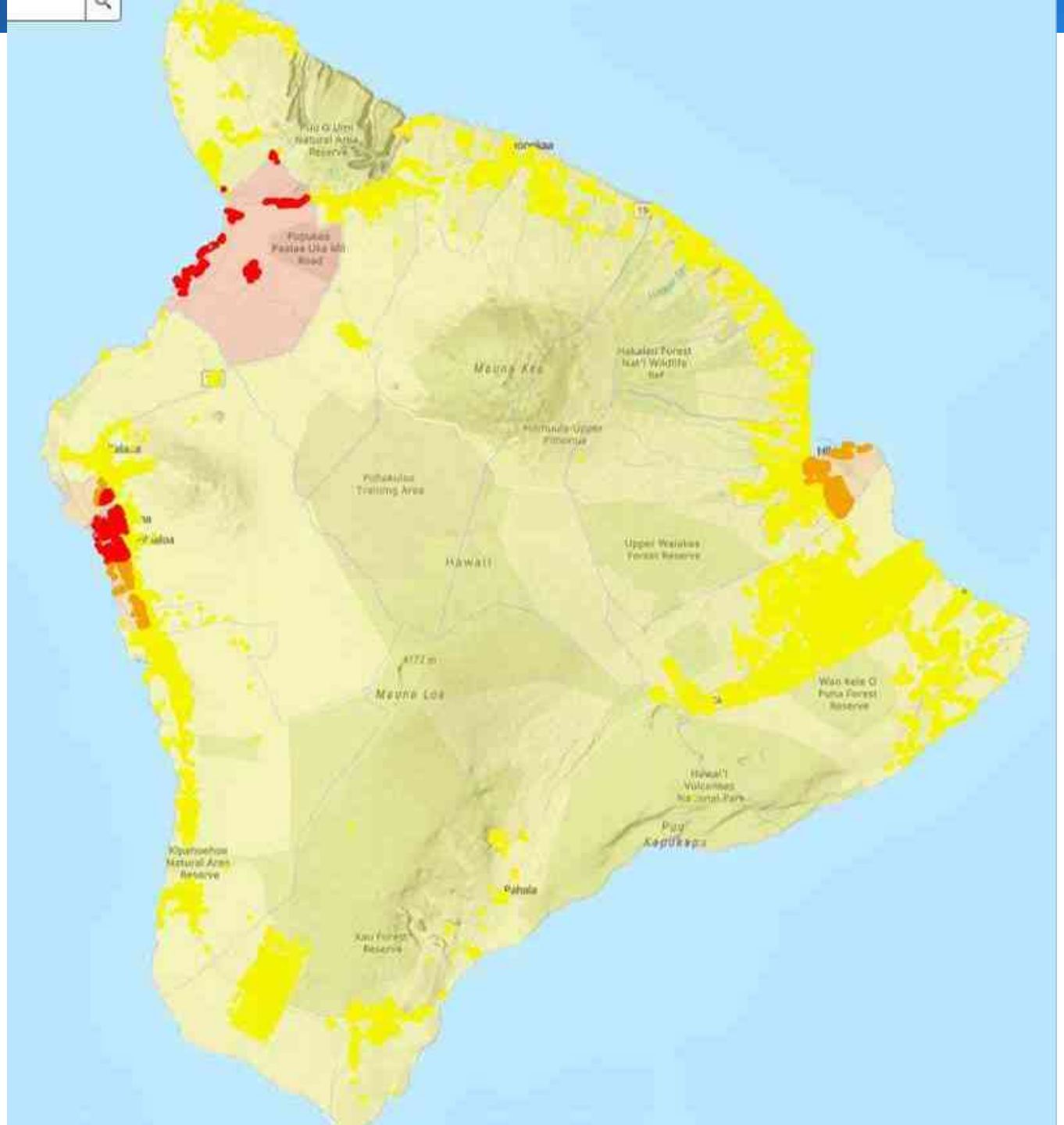
http://hawaiicesspooltool.org/

Hawaii Island Results

Priority 1:
5,119 (11%)

Priority 2:
2,619 (6%)

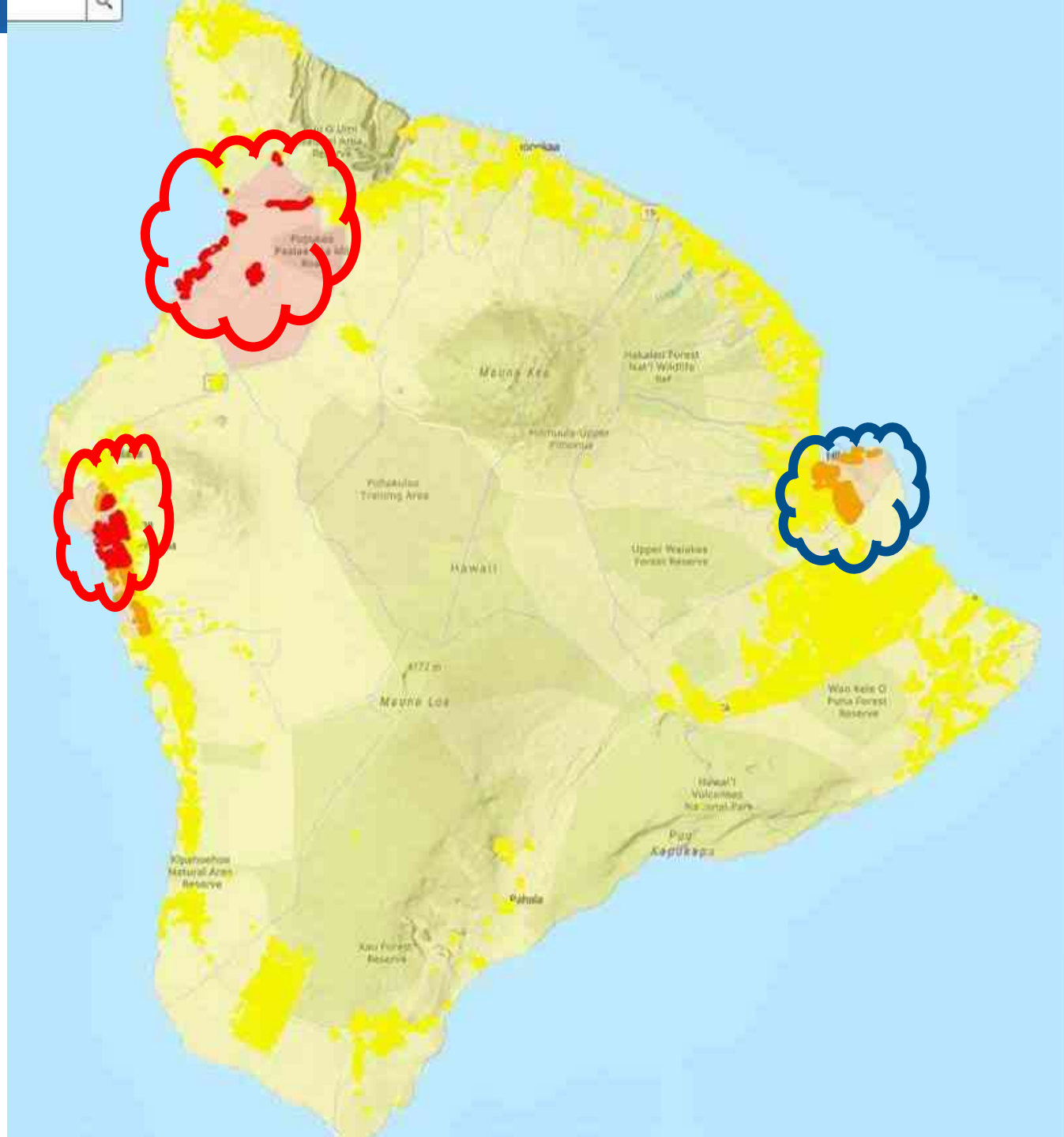
Priority 3:
40,858 (84%)



Hawaii Island Results

Priority 1:
Kawaihae/Waikoloa
Holualoa

Priority 2:
Hilo
Kaumalumalu/Keahou



Cesspool Conversion Working Group Informational Briefing for the

Cesspool Conversions Finance Research

February 21, 2023

carollo
Engineers...Working Wonders With Water®

// Agenda

01 Affordability Analysis

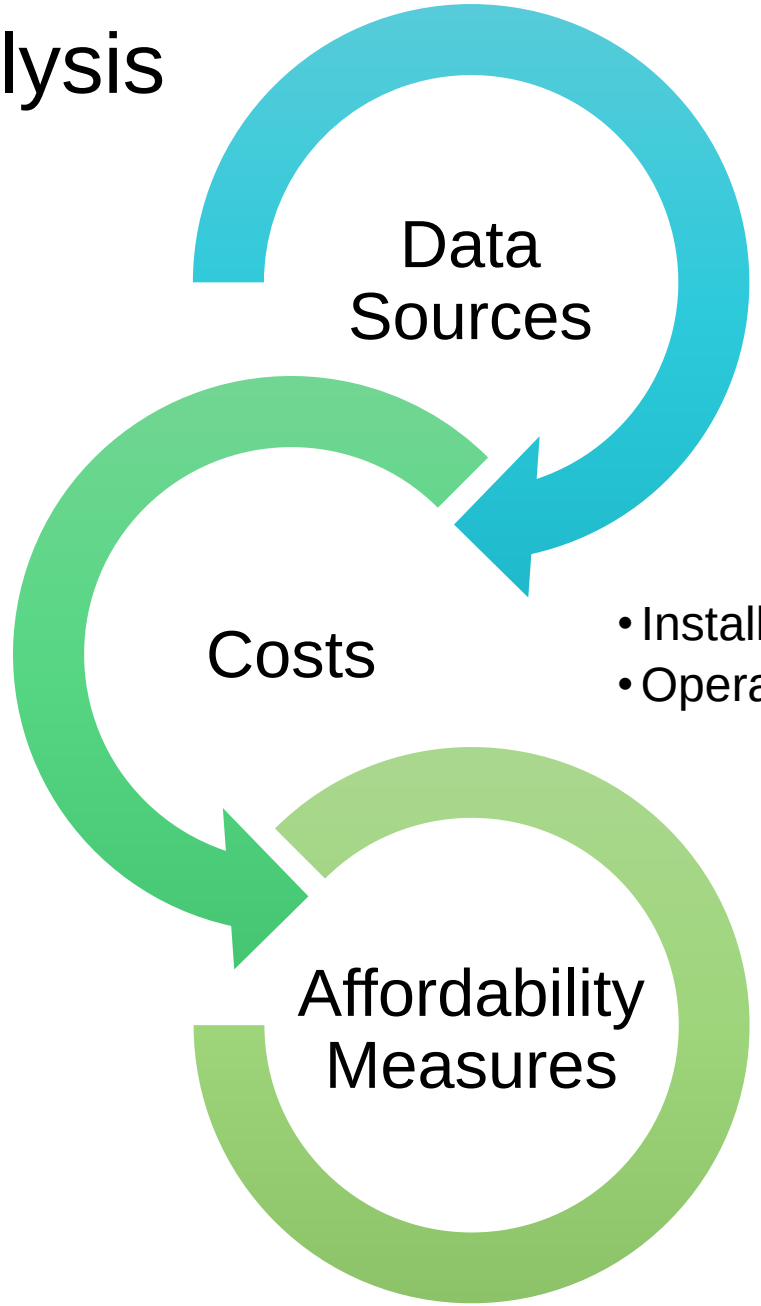
02 Funding Options

03 Factors That Affect Cesspool Conversion Programs

04 Findings and Recommendations

Affordability Analysis

// Affordability Analysis
Methodology



- Geographic Information System (GIS)/Cesspool locations
- Median Household Income (MHI) for Census Block Groups (CBG)
- Priority Areas

- Installation Costs
- Operations & Maintenance (O&M) Costs

- Comparison to Average Sewer Bill
- Percent of MHI
- Federal Poverty Levels (FPL)

// Financial Impact of Cesspool Conversions

Cost Description	Low	Average	High
Cesspool Conversion Construction Cost (total)(1)	$10,000	$23,000	$38,000
Interest rate (percent)(2)		4.0	
Loan Term (years)(2)		20	
Cesspool Conversion Construction Cost (monthly)(2)	$61	$139	$230
Estimated O&M Cost (monthly) (3)	$33	$71	$108
Estimated Monthly Cost	**$94**	**$210**	**$339**

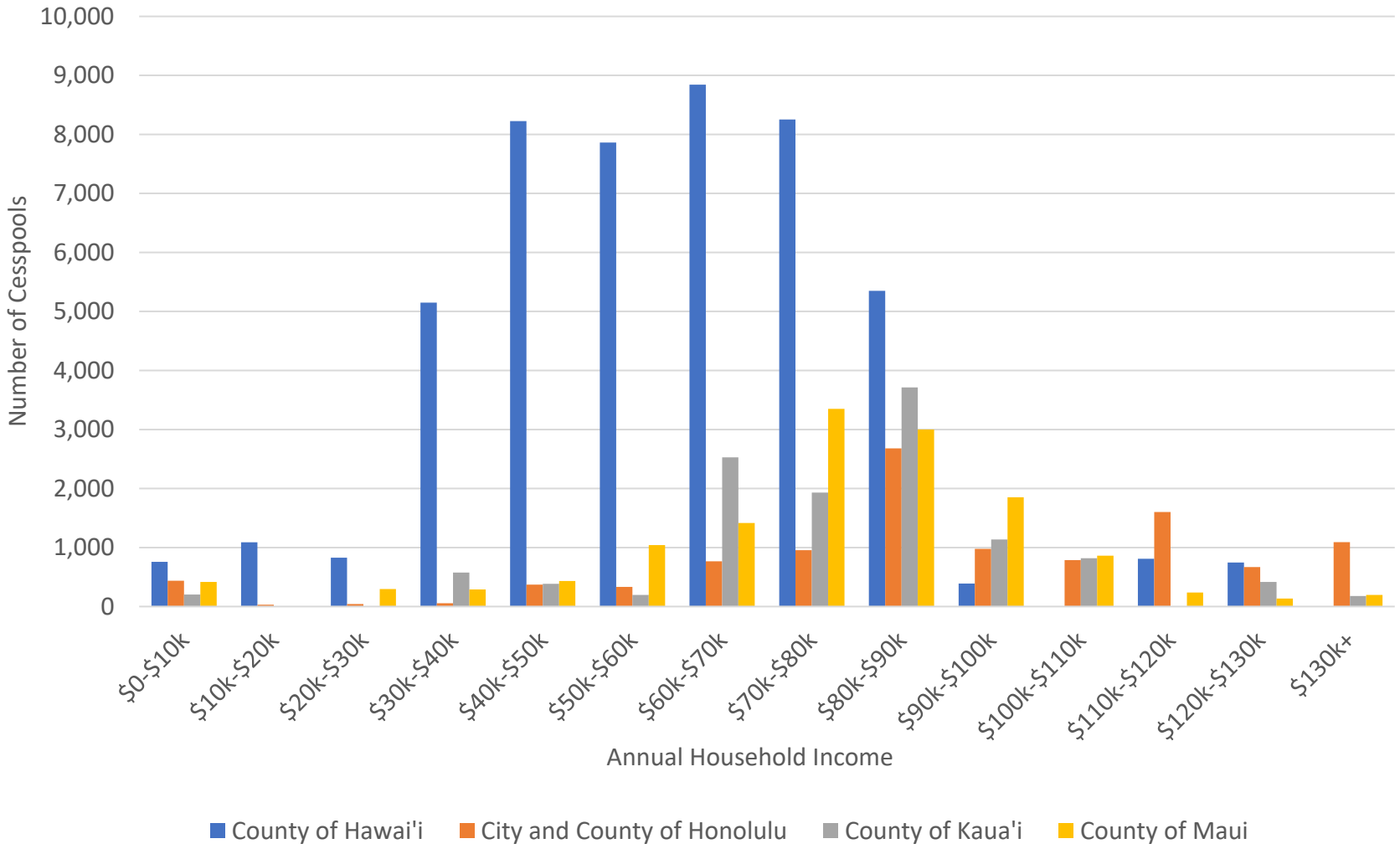
Notes:

1. Installation costs are based on historical installation costs for septic tank and ATU treatment and disposal systems from DOH. The low-end cost represents the 10th percentile, and the high-end cost represents the 90th percentile. All conversion costs are site specific and these installation costs may not be representative for more complex sites/installations.
2. Installation costs are assumed to be financed over 20 years at 4 percent based on market rates for home equity loans as of July 2020.
3. Monthly operating costs are estimated with the low end representing septic tank operations costs. The high end represents a higher level of treatment with ATU + UV disinfection + seepage pit. The median operations cost is the median of the low- and high-end operations costs.

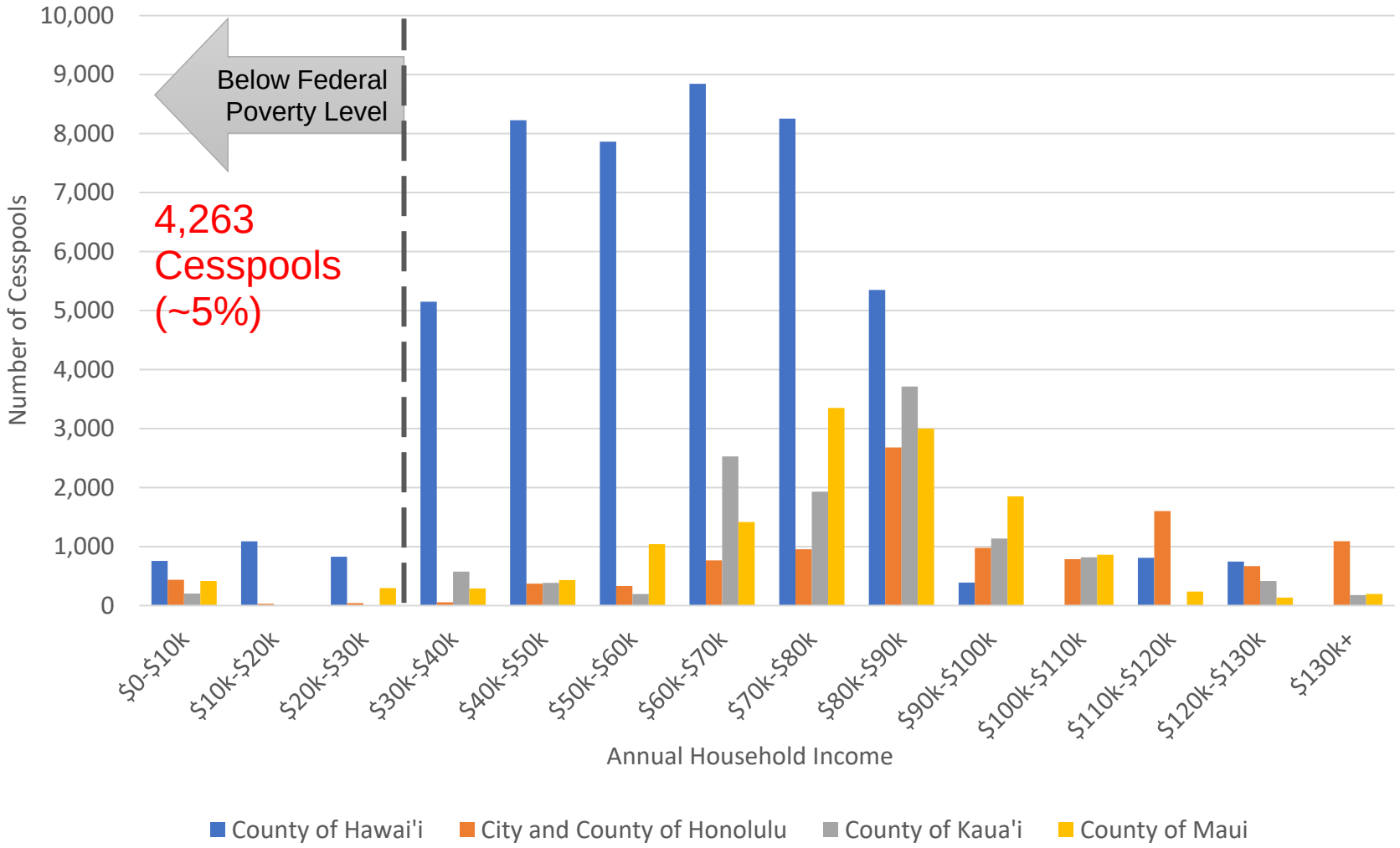
// Affordability Measures

- Federal Poverty Level
  - Annual income < $30,718
- Percent of Median Household Income
  - Financially burdened if conversion cost is greater than 2% of MHI
  - Annual income < $126,125

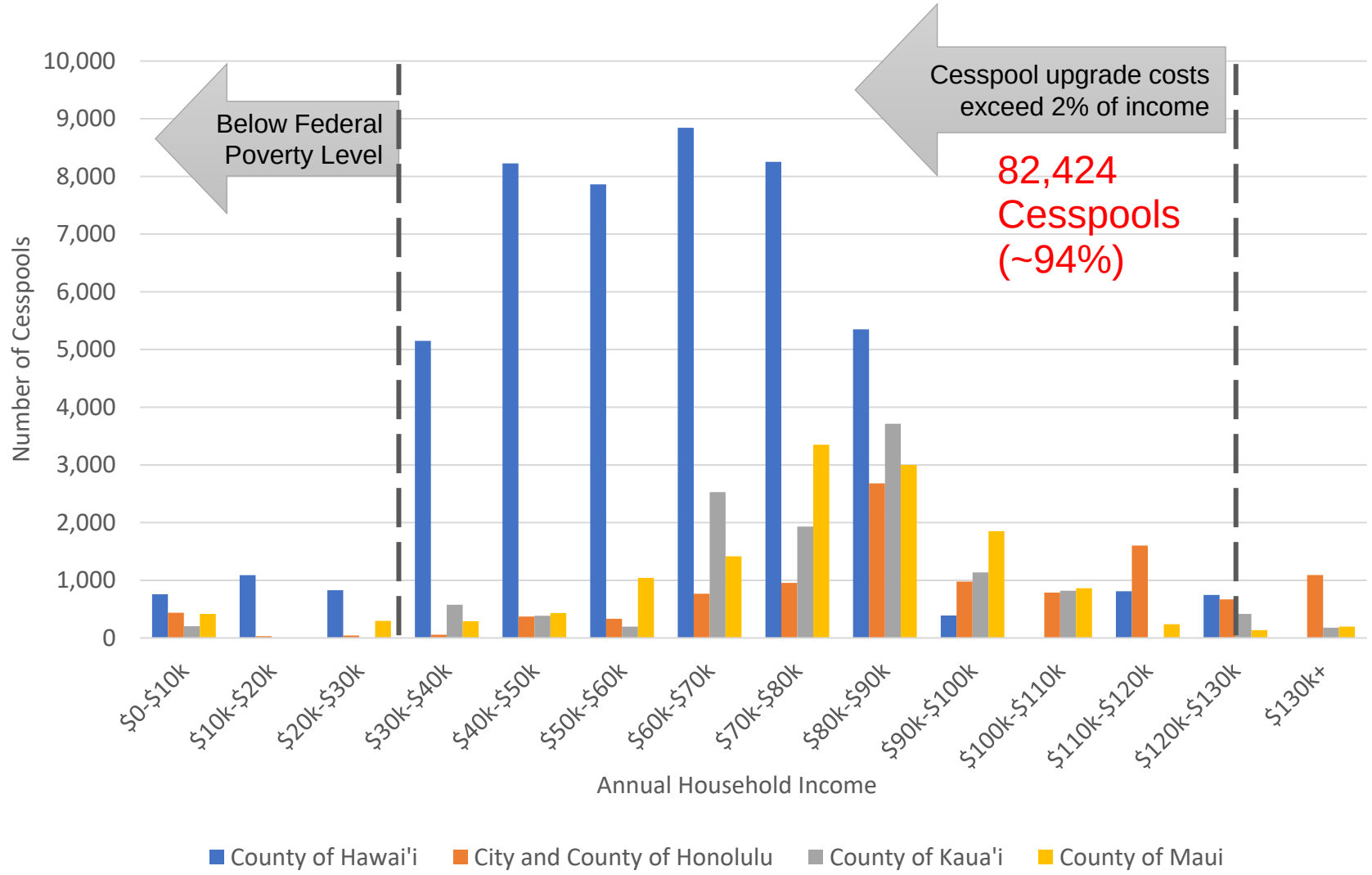
// Statewide Cesspool Conversion Affordability Results



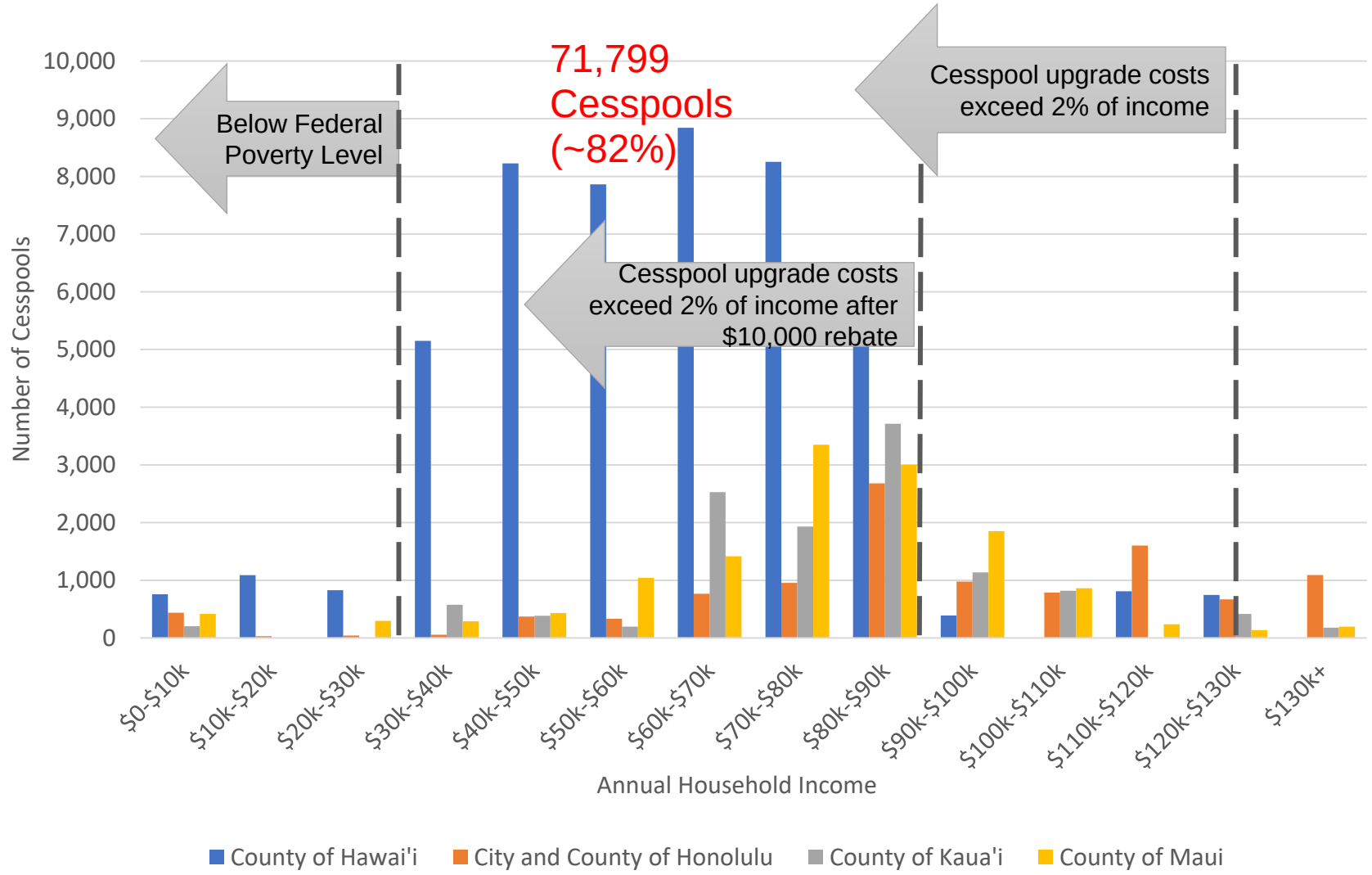
// Statewide Results: FPL



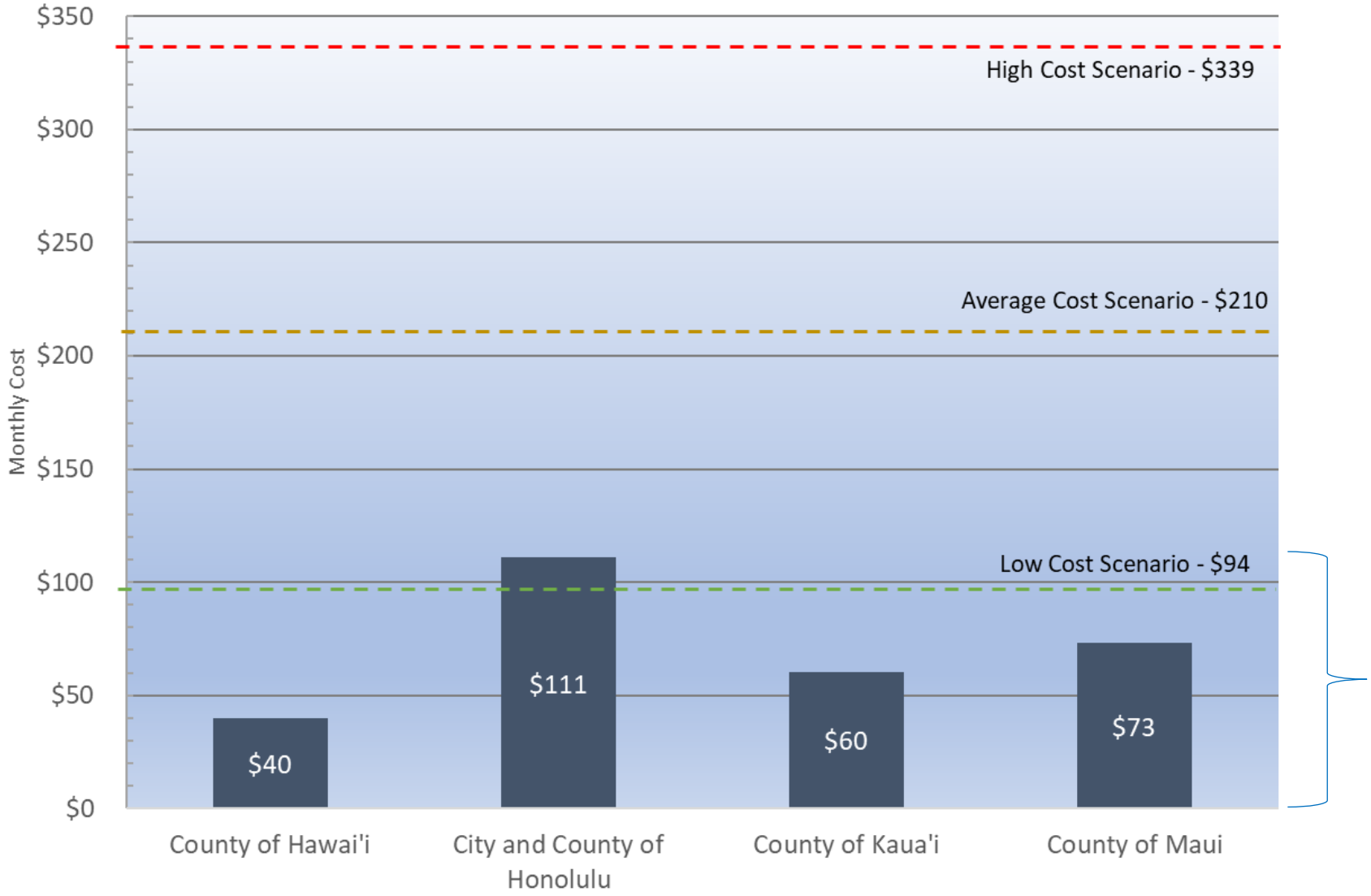
// Statewide Results: FPL, MHI



// Statewide Results: FPL, MHI, $10K Rebate



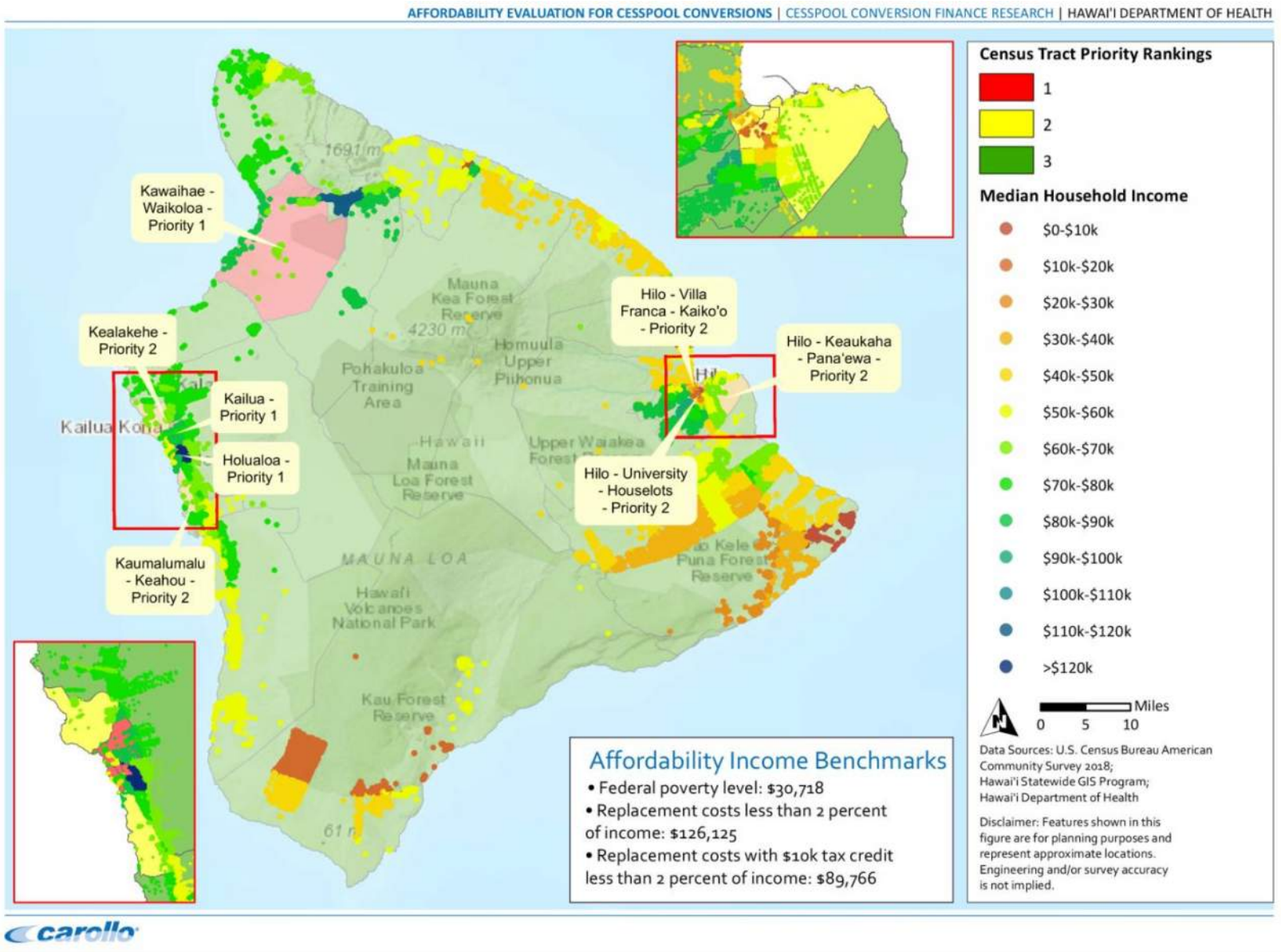
// Typical Monthly Sewer Bill Compared to Monthly Cesspool Conversion Costs for Average Scenario



Monthly sewer bills are not representative of total cost to Counties of sewer

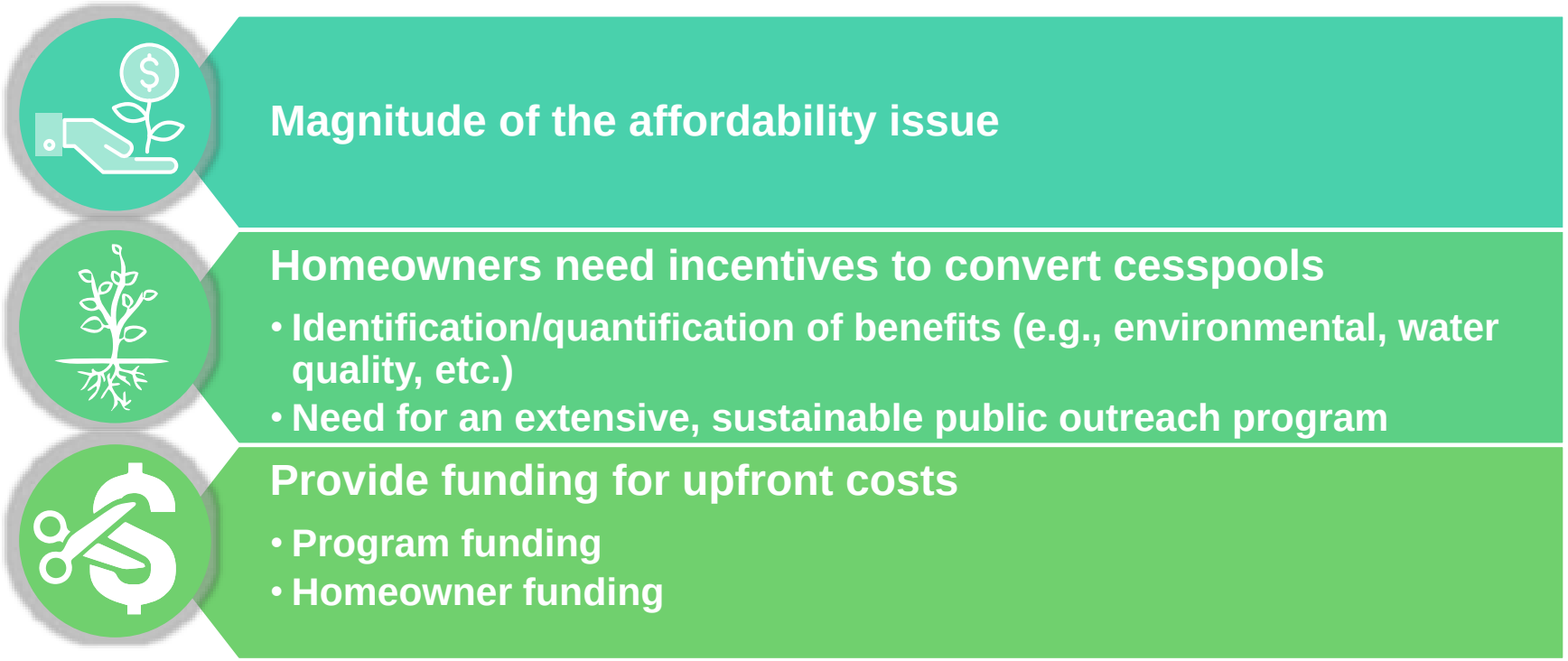
// Hawai‘i County

- Greatest affordability challenges (98% financially burdened)
- Most cesspools of all counties
- Least access to centralized sewers, 71% without sewers
  - Oahu: 3% have cesspools
  - Maui: 22% have cesspools
  - Kauai: 54% have cesspools



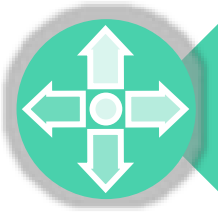
Funding Options

// Cesspool conversion: Funding program challenges



// Cesspool conversion: Funding program challenges *(cont'd)*

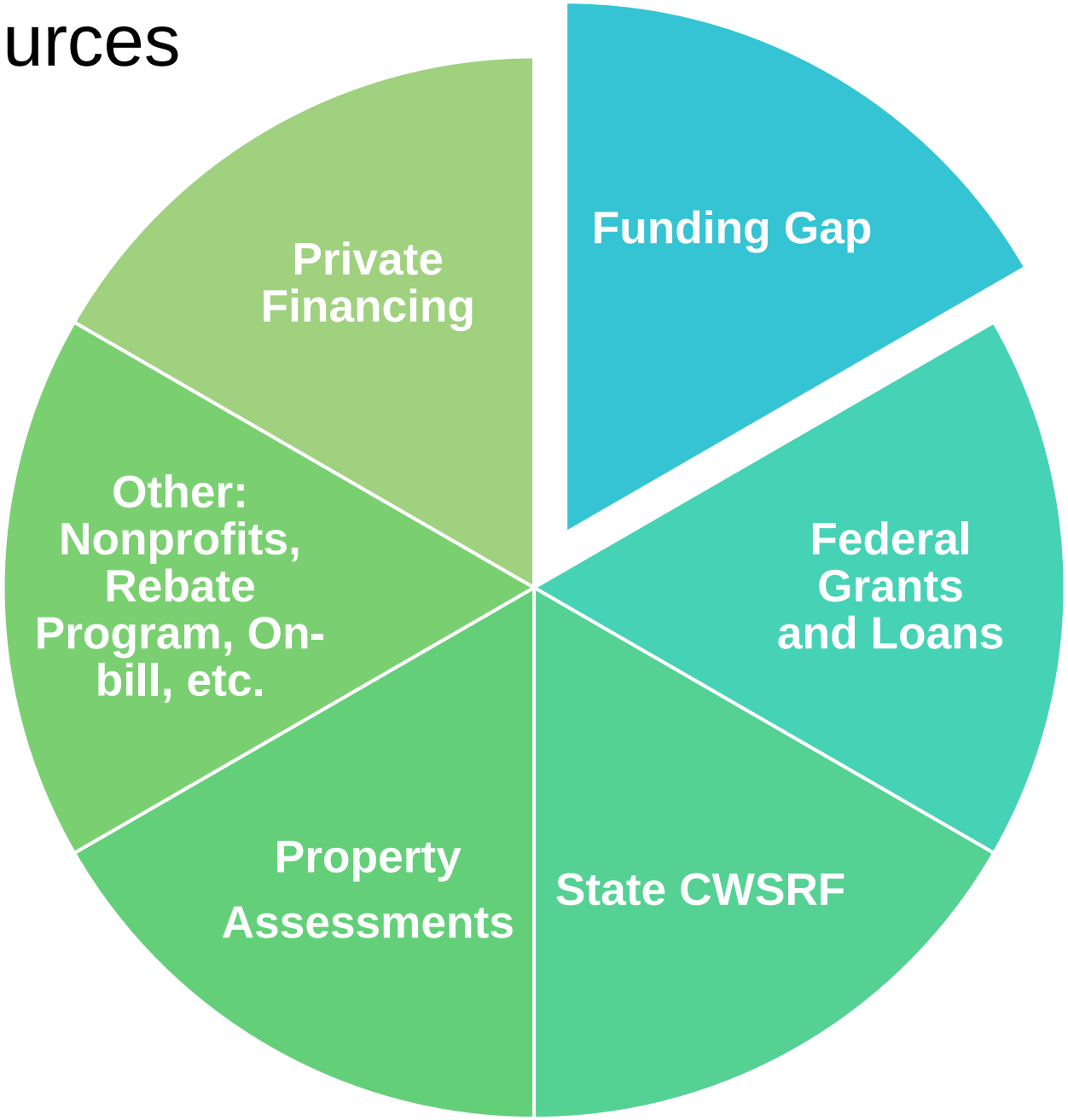
Consider the funding recipient—Homeowner or other entity



Potentially fund a variety of conversion options

Legislation/Governance Structure

// Funding sources

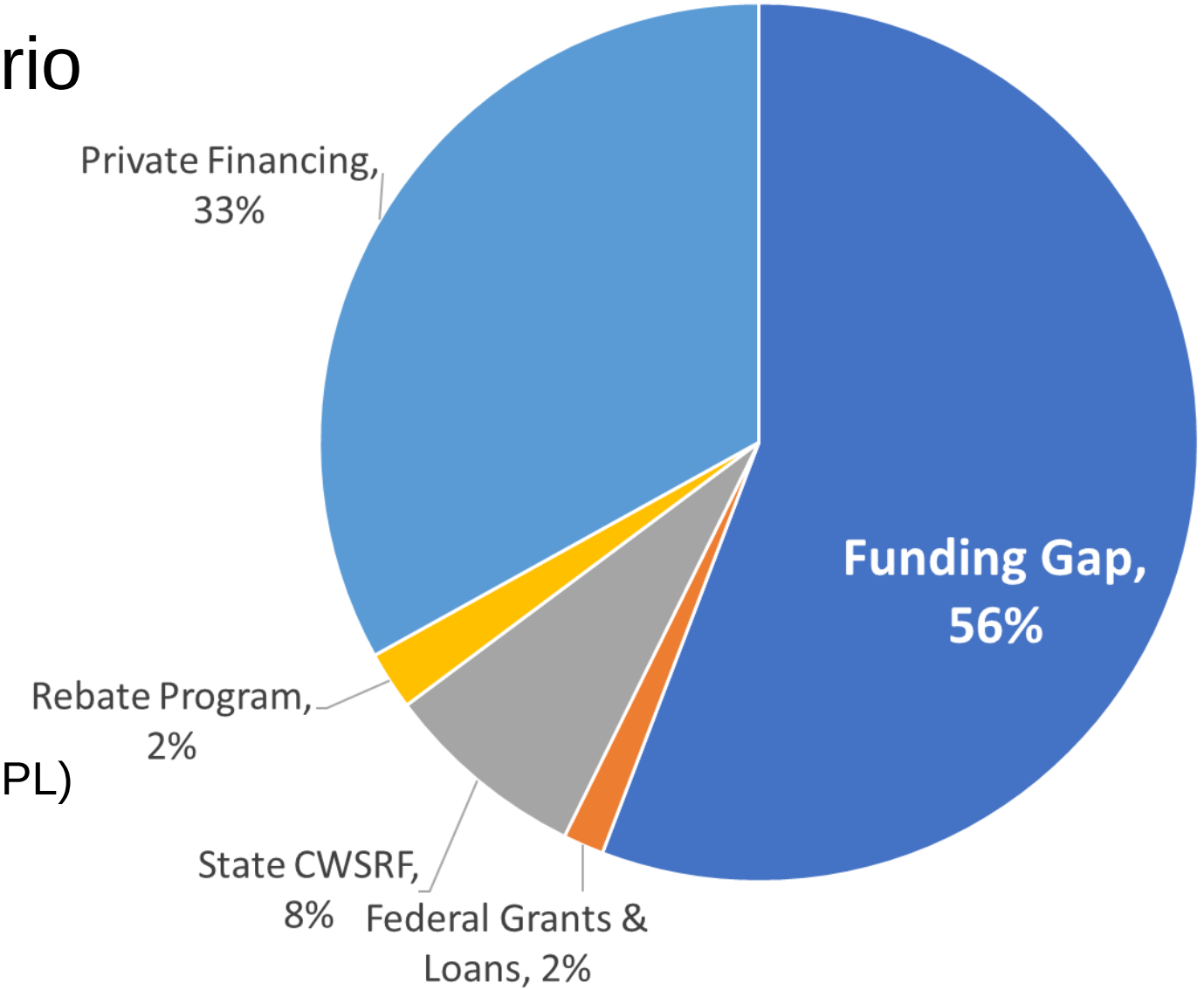


// Funding options: Hypothetical scenario

What are the pieces of the funding "pie"?

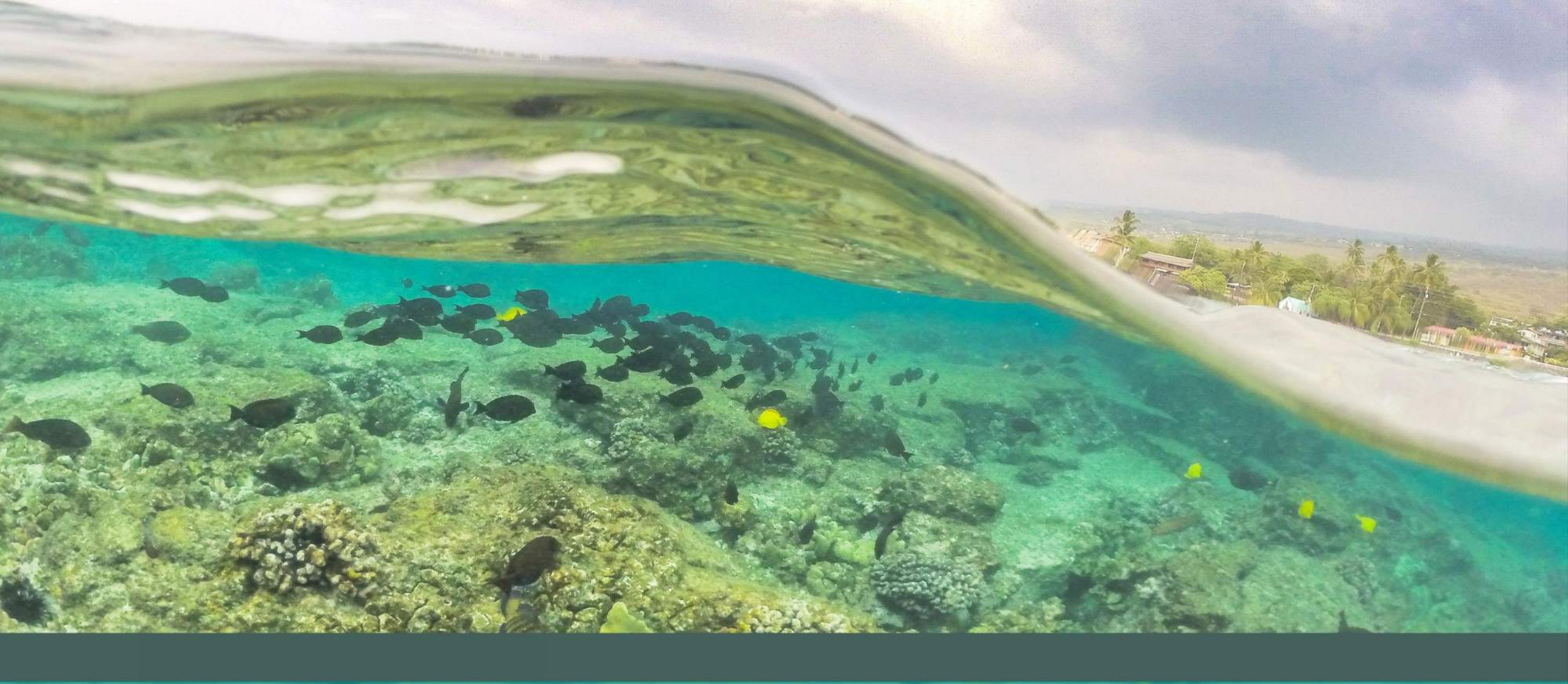
Assumptions:

- Total conversion cost: $2B
- State CWSRF: $150M (@$5M/yr * 30 yrs)
- Federal grants/loans: $30M (@$1M/yr * 30 yrs)
- Rebate program: $43M ($10K rebate for those below FPL)
- Private financing: $661M
- **Funding gap: $1.1B**



Funding:
Key takeaways from other states

- Magnitude of the funding needed vs. available funds
- Need for sustainable financing mechanisms to cover program administration and other costs
- Other states with successful programs had:
  - Suite/portfolio of funding options
  - **Early** and **extensive public outreach** and education
  - State programs to help pay for conversions
    - Low interest loans
    - Conduit agencies/partnerships



Factors That Affect Cesspool Conversion Programs

// Factors that affect cesspool conversion programs

Public acceptance and education

- Environmental benefits
- Methods of conversions
- Technical & financial resources

Perception of inequity

- Site-specific costs
- Conversion costs compared to sewer fees

Near-term incentives to convert

- Aggressive pace of conversions to meet deadline(s)
- Focus on priority areas

Available workforce and resources

- Professionals
- Contractors/materials
- O&M

Responsible management entity

- Single management entity
- Long-term

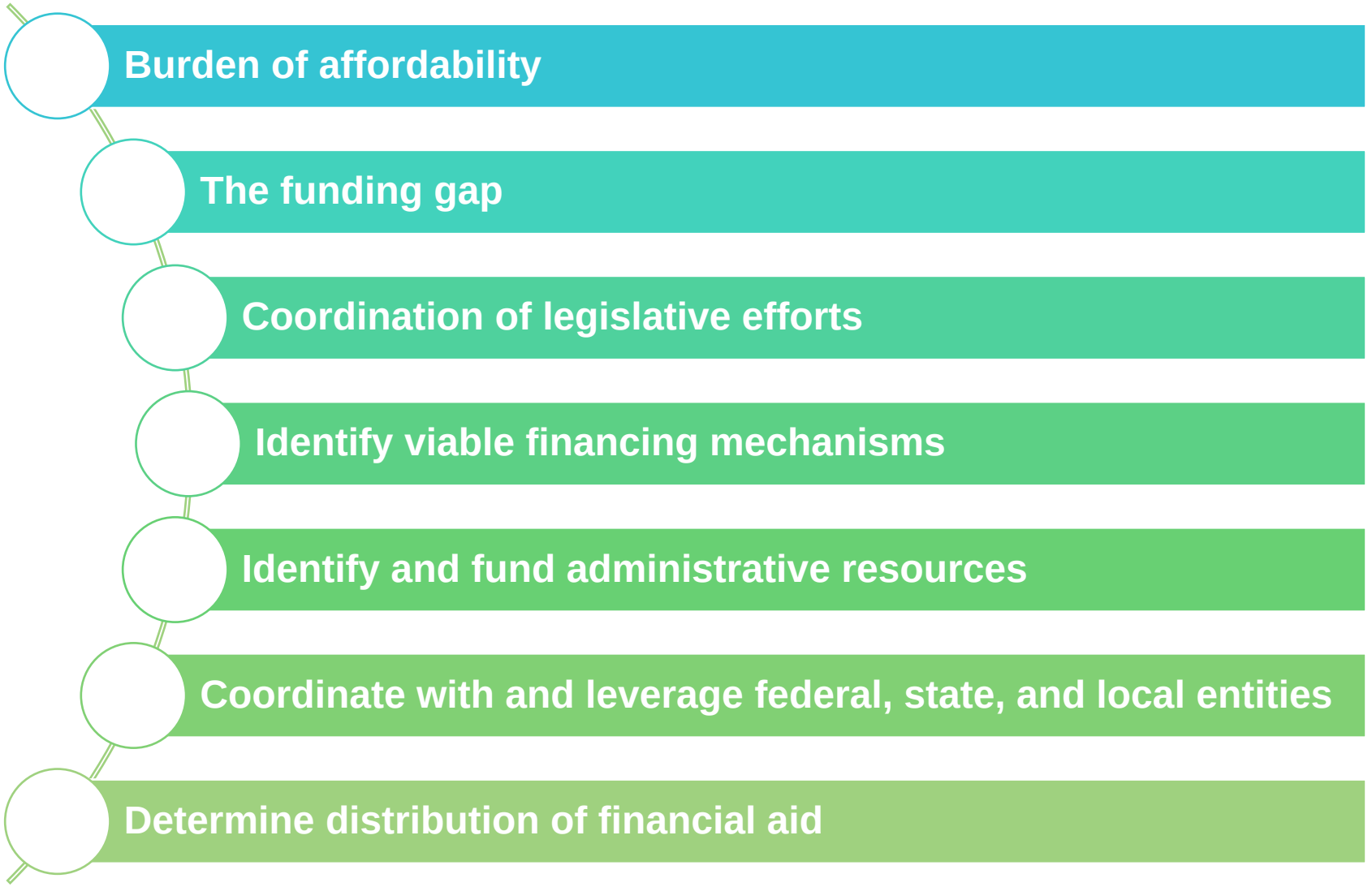
Stable source of revenue

- Support funding program
- Administrative costs

Findings and Recommendations

// Summary of Findings & Recommended Next Steps:

Finance & Program Development



- **Prioritization and Timing**
- **Financial Support**
- **Technology Considerations**
- **Planning/Program Administration**
- **Workforce Development**
- **Outreach**

FINAL REPORT RECOMMENDATIONS

Prioritization and Timing

Replace the 2050 deadline, from Act 125 Session Laws of Hawaii (SLH) 2017, for cesspool conversion as follows:

- Priority 1 (13,821 cesspools) converted by 2030, and
- Priority 2 (12,367 cesspools) converted by 2035.
- Priority 3 (55,237 cesspools) would continue to be converted by 2050.

Require a seller's disclosure form for any property sold that has a cesspool.

FINAL REPORT RECOMMENDATIONS

Financial Support

Maximize federal funding options where available to offset the cost of conversion:

- Including grants, tax credits, and low interest loans, funds under the Infrastructure Investment and Jobs Act funds, Inflation Reduction Act, and American Rescue Plan Act.

Reallocate State and county resources or generate new revenue to supplement other financing programs and homeowners' dollars.

Facilitate financing options to assist low- and moderate-income homeowners in converting, as well as incentives for cesspool conversion for all homeowners.

Enable nonprofits and community development financial institutions to help cesspool owners access available funding through the Clean Water State Revolving Funds.

FINAL REPORT RECOMMENDATIONS

Planning/Program Administration

- Require each County to develop a **comprehensive integrated wastewater management plan** to include where connections to centralized (public and private) treatment systems are planned, where individual treatment systems will continue to be needed, and where smaller-scale “cluster” treatment systems might be utilized. Include financial strategies.

- Establish a **cesspool section** within the Hawaii Department of Health’s Wastewater Branch to include at least three to four staff to work on cesspool conversions planning, implementation, permitting, and regulatory framework.

- **Increase administrative capacity** as needed for cesspool conversion on State lands.

- **Prioritize environmental justice principles** for disadvantaged community needs to promote equitable outcomes related to the entire cesspool conversion process.

FINAL REPORT RECOMMENDATIONS

Outreach

- Fund the development of a comprehensive outreach strategy for cesspool conversions that educates homeowners on conversion options and resources.

End Presentation