

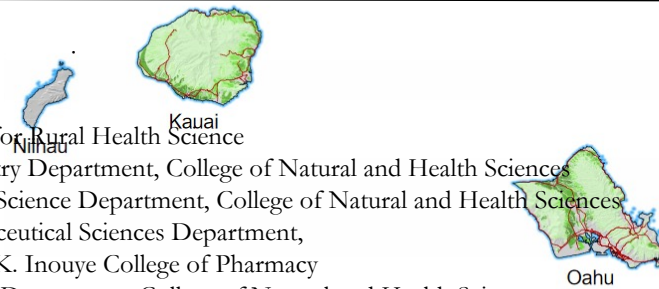
# Big Island Drink Smart (BIDS)

NSF Project\_ID: 1952263

Karen Pellegrin, University of Hawai`i at Hilo (UHH) Center for Rural Health Science  
PG, FY2020

## Principal Research Investigators

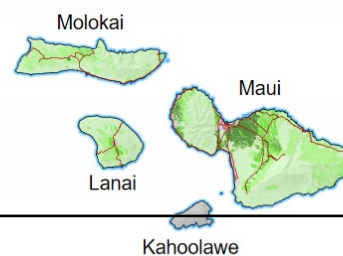
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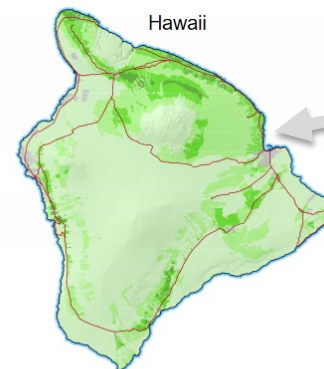
## Community Partners

Sally Ancheta  
Hawai`i Public Health Institute  
Hawai`i Island Rural Health Association



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# Project Overview

Potential drinking water risks

Community-driven smart technology

Water system type and maintenance

Human-in-the-loop AI

Proximity to agriculture, cesspools

GIS inputs

Rainfall, wind & topography

Targeted education and resources

Socioeconomic vulnerability

User-friendly apps

## Project Vision

Our Vision for a future IRG proposal:  
To engage the Big Island community in building and disseminating smart technologies to achieve the long-term objective of reducing risk from drinking water in Hawaii County.



# Project Overview

## Use-Inspired Research

**PROBLEM:** Ensuring safety and quality of home drinking water from individual water systems (rainwater catchment and wells) that are common on Hawai`i Island (“Big Island”) and in other rural communities.

## PG Activities

***Pilot Data Collection:*** To begin identifying contaminants in drinking water in Hawaii County (Planning Grant objective #1), drinking water from 15-20 households with individual water systems (well or rainwater catchment) will be sampled.

***Community Engagement:*** To establish a community network of stakeholders who will be meaningfully involved in subsequent integrative research and the development of smart technologies to improve water quality (objective #2), the BIDS team will leverage and expand UH Hilo’s existing community partners

## Survey excerpts

Traditional AI focuses on automating tasks that a human would typically perform so that a human is not needed. In contrast “Human-in-the-Loop” AI focuses on building systems in which AI works as a teammate or assistant to the human.

QUESTION: How much do you support or oppose the development of “Human-in-the-Loop” AI?

- Strongly support
- Somewhat support
- Neither support nor oppose
- Somewhat oppose
- Strongly oppose
- I don't know

Do you feel comfortable installing and using apps on your phone?

- yes, very comfortable
- yes, somewhat comfortable
- no, somewhat uncomfortable
- no, very uncomfortable

COMMENTS: \_\_\_\_\_

Do you feel comfortable installing and using apps on your desktop or laptop computer?

- yes, very comfortable
- yes, somewhat comfortable
- no, somewhat uncomfortable
- no, very uncomfortable

COMMENTS: \_\_\_\_\_

If you had an app for sharing water system information (e.g., water test results, types of filters used, etc.) so that the app users could learn from each other with the goal of improving drinking water quality, would you be willing to share information about your water system?

- yes, definitely
- yes, probably
- no, probably not
- no, definitely not

COMMENTS: \_\_\_\_\_

Circle the answer that you think describes your community/neighborhood most accurately. Describe how people in this community/neighborhood generally behave or think (not how you generally behave or think).

	Almost Never	Sometimes	Often	Almost Always
People help each other	1	2	3	4
People obey the law	1	2	3	4
Safety is important to people	1	2	3	4

Excerpts from the Community Culture Survey (Pellegrin KL, Nigg CR. The Community Culture Survey: Preliminary findings from a new approach to measurement and understanding health disparities. Journal of Community Psychology. 2017 Mar;45(2):283-9.)

# Project Update

## Activities to date.

- Survey and recruitment plans revised and approved by IRB (survey addresses individual water system type and practices, use of technology, opinions on AI versus human-in-the-loop AI, and community culture)
- Homeowner interview, recruitment, and COVID-19 safety plans under review by IRB
- Laboratory protocols approved by IBC (includes testing for rat lungworm disease parasite, nontuberculous mycobacteria, and standard parameters)
- Discussions ongoing with EPA researcher on methods for suspect screening and non-targeted analysis of drinking water (Newton et al., 2018)





Environmental Pollution

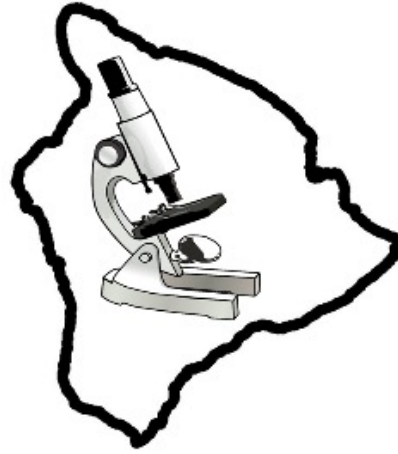
Volume 234, March 2018, Pages 297-306



Suspect screening and non-targeted analysis of drinking water using point-of-use filters ☆

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# Project Evolution



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## *A local team builds local trust*

*That the BIDS researchers live and work here matters. Scientists from across the state and around the world come to the Big Island to study one of the most unique and diverse ecosystems in the world. Some of them have not sought or earned the trust of the Big Island community.*

*UH Hilo already has many established community partnerships, and the BIDS project is an important opportunity for us to continue strengthening and expanding our local ties. Sharing what we learn from the community with the community is a key way our local team will continue to build local trust.*