

Big Island Drink Smart (BIDS)

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What factors contribute to contaminants in residential drinking water in rural communities?

Can drinking water risks be reduced through community-driven smart technologies?

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.

Health threats are increasing due to the use of unregulated private water systems that are most common in rural areas³ and used by at least 15% of the US population⁴. The BIDS team seeks to advance knowledge of the complex factors that contribute to rural drinking water risk.

³Institute of Medicine Forum on Microbial Threats. Global Issues in Water, Sanitation, and Health; 2009

⁴CDC National Center for Environmental Health, Rural water supplies and water-quality issues

PROJECT 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 water⁵

⁵Newton et al. Suspect screening and non-targeted analysis of drinking water using point-of-use filters. Environmental pollution. 2018 Mar 1;234:297-306

Immediate Broader Impact: BIDS will advance knowledge to support public health and policy decisions in emerging infectious diseases as well as safe use of rainwater catchment systems, which are increasingly being used across the US to address water shortages⁶.

⁶National Conference of State Legislatures, State Rainwater Harvesting Laws and Legislation, 2018

Sustainable Broader Impact: BIDS will expand opportunities for students to engage in locally relevant problems of science, a recommended approach to inspiring rural youth into STEM education and careers⁷.

⁷Peterson et al. Rural students in Washington State: STEM as a strategy for building rigor, postsecondary aspirations, and relevant career opportunities. Peabody Journal of Education. 2015 Mar 15;90(2):280-93

NEXT STEPS:

- Collect and analyze pilot data
- Begin planning for AI-driven technology to assist residents in measuring and managing water quality
- Form BIDS Community Advisory Board
- Prepare for Integrative Research Grant