“The good people of the world will find my data.”

NSF RESEARCHER, ENVIRONMENTAL ENGINEER, LABORATORY PHOTOCHEMIST, INITIATED RAPID DRINKING WATER SAMPLING CAMPAIGN IN PUERTO RICO AFTER HURRICANE MARIA

– NEW HYDROSHARE USER

Collaborative RAPID

BUILDING INFRASTRUCTURE TO PREVENT DISASTERS LIKE HURRICANE MARIA

	OBJECTIVE 01 **Water Quality Sampling Campaign**	OBJECTIVE 02 **Data Archive**	OBJECTIVE 03 **Cyberinfrastructure Advances**	**Expected Science Outcomes**
PUBLIC ACCESS INFORMATION	Drinking water samples from public streams Spatially aggregated anonymized information of the impact zone	Baseline assessment: Population Health Data, Healthcare Providers and supporting organizations, natural system environmental variables, Public Water System location and infrastructure status. Hurricane Maria health and environmental data from public data repositories and Luquillo CZO instruments in El Yunque National Park	LANDLAB raster model grid and diverse data formats → Observation Data Model (ODM2) →	**DISASTER:** Contamination, drought, landslides, bio-diversity **DRINKING WATER:** Geographic location and use data
PRIVACY PROTECTED INFORMATION	PRASA Utility, community operated tank system, household data Teacher collection of student health data (IRB)	Water samples with personal information De-identified water samples that can be geo-located	Population health researcher user-testing → Water quality professionals and researchers user testing Individual data owners user testing	**HUMAN IMPACT:** Spatial distribution of contamination or drought

HYDROSHARE

Overview

Widespread disruption of drinking water distribution systems in Puerto Rico following Hurricane Maria poses a significant risk to human health. Thus, it is necessary to strategically archive and disseminate water resources data relevant to public health and environmental concerns. This project seeks to design and test a prototype scientific cyberinfrastructure that integrates existing hardware and software platforms for the storage and curation of water resources data and analytical tools following natural disasters that cause loss of public utilities.

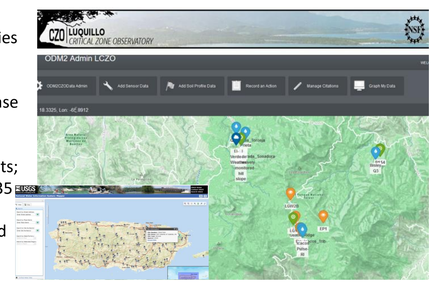
Broader Impacts

This research deepens our understanding of the impact of high-profile extreme events, which will inform recovery efforts in Puerto Rico and strengthen emergency preparedness protocols and self-resiliency in other communities subject to hurricane flooding. In partnership with CUAHSI HydroShare and Water Data Services, data collected in this project will be reported in a consistent, documented format and broadly accessible to the research community. This project is expected to develop a data-driven approach for reducing uncertainty about ongoing and disaster-related changes in drinking water quality.

The Drinking Water Campaign could not have been possible without the collaboration of **Centro de Educación, Conservación e Interpretación Ambiental (CECIA) of Inter American University of Puerto Rico** led by Graciela Ramirez-Toro.

Virginia Tech researchers in Puerto Rioo include: William Rhoads, Virginia Riquelme, Kelsey Pieper, Amy Pruden, Ishi Keenum, Ben Davis, Matthew Blair, Greg House.

153 time series
6.5+ million time series values
40 instruments
ODM2 SQLite Database
Working on adding data from 75 + additional instruments; 40 air temperature, 35 soil moisture and O2 sensors, Weather and ground water



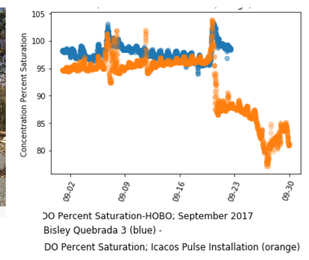


Photo Courtesy of Mandalit Del Barco/NPR. Richard Colón, better known by his stage name Crazy Legs, at his home in Isabela, Puerto Rico, shows the before-and-after of the water filtration system he’s helping deliver to people in remote areas. This photo originally appeared in NPR.

Research Team

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Intellectual Merit

The proposed cyberinfrastructure will integrate heterogeneous datasets (e.g., water quality, geospatial surveys, human health information) and provide a unique resource for interdisciplinary researchers to examine how natural-human coupled systems respond to extreme events.

SI2 RAPID Collaborative
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NSF SI2 PI meeting
April 3-May 1, 2018