

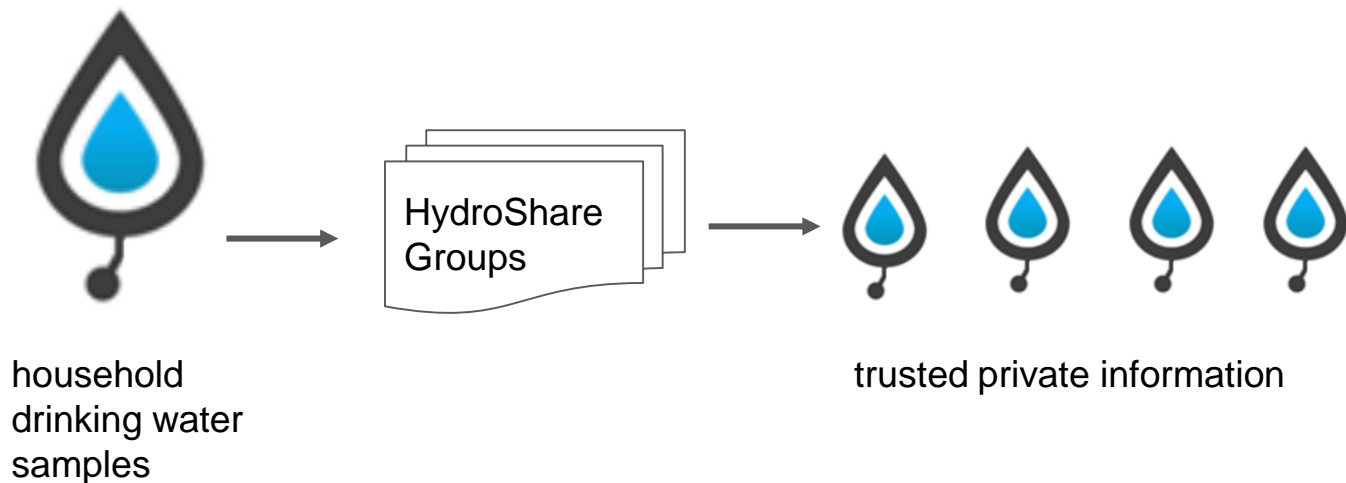
water mesh



Christina Bandaragoda
SCGI-ESIP Bootcamp
November 6-7, 2019
Boulder Colorado

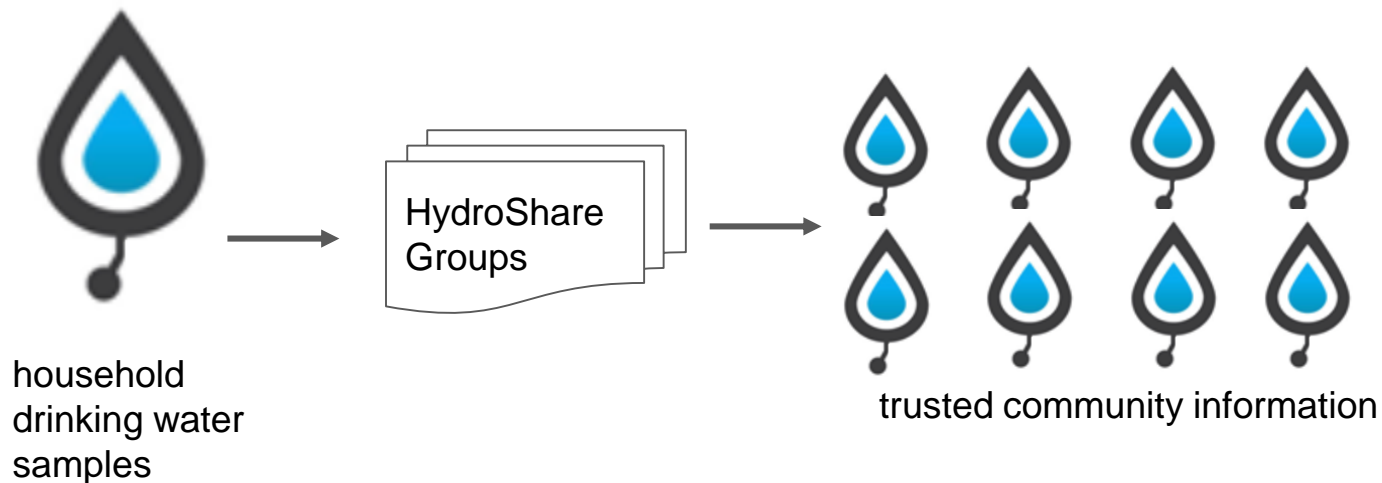
water mesh

clean water for everyone



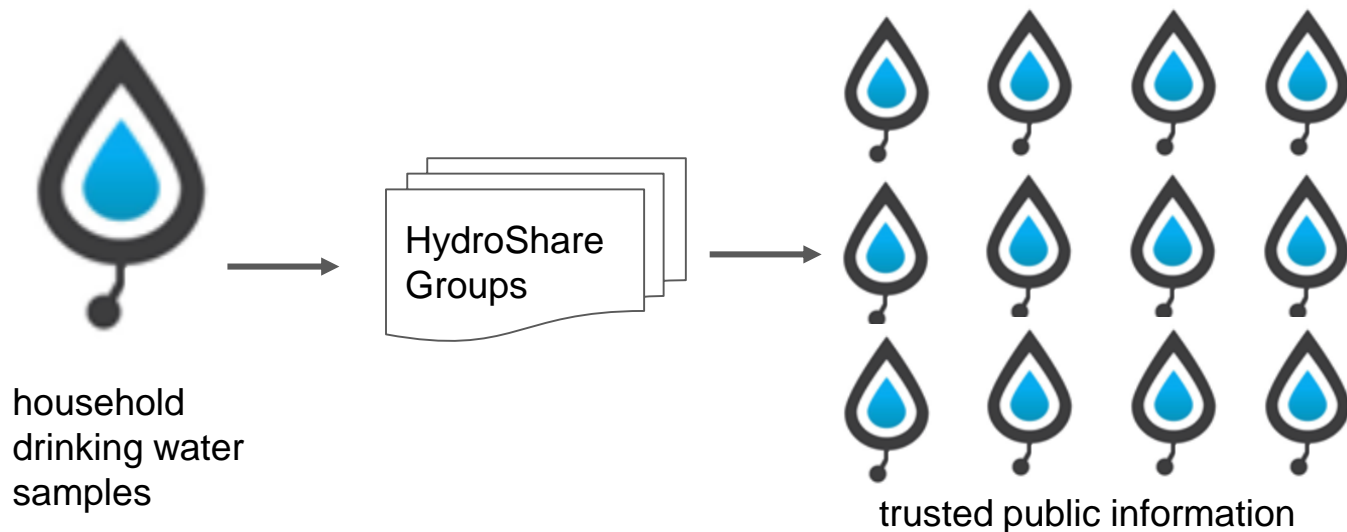
water mesh

clean water for everyone



water mesh

clean water for everyone



water mesh

online infrastructure for real-world health impacts

Data

- chemistry
- sediment
- microbe contamination
- upstream areas
- climate data
- terrain
- households



Cyberinfrastructure
-code
-apps
-custom reports



Current State and Risk scenarios
to Safe Drinking Water

We have targeting
water non-profit organizations with
a story-telling website,
expert reviewed articles,
and online training tools
to provide the value of
benchmarking
water quality improvements and risks.

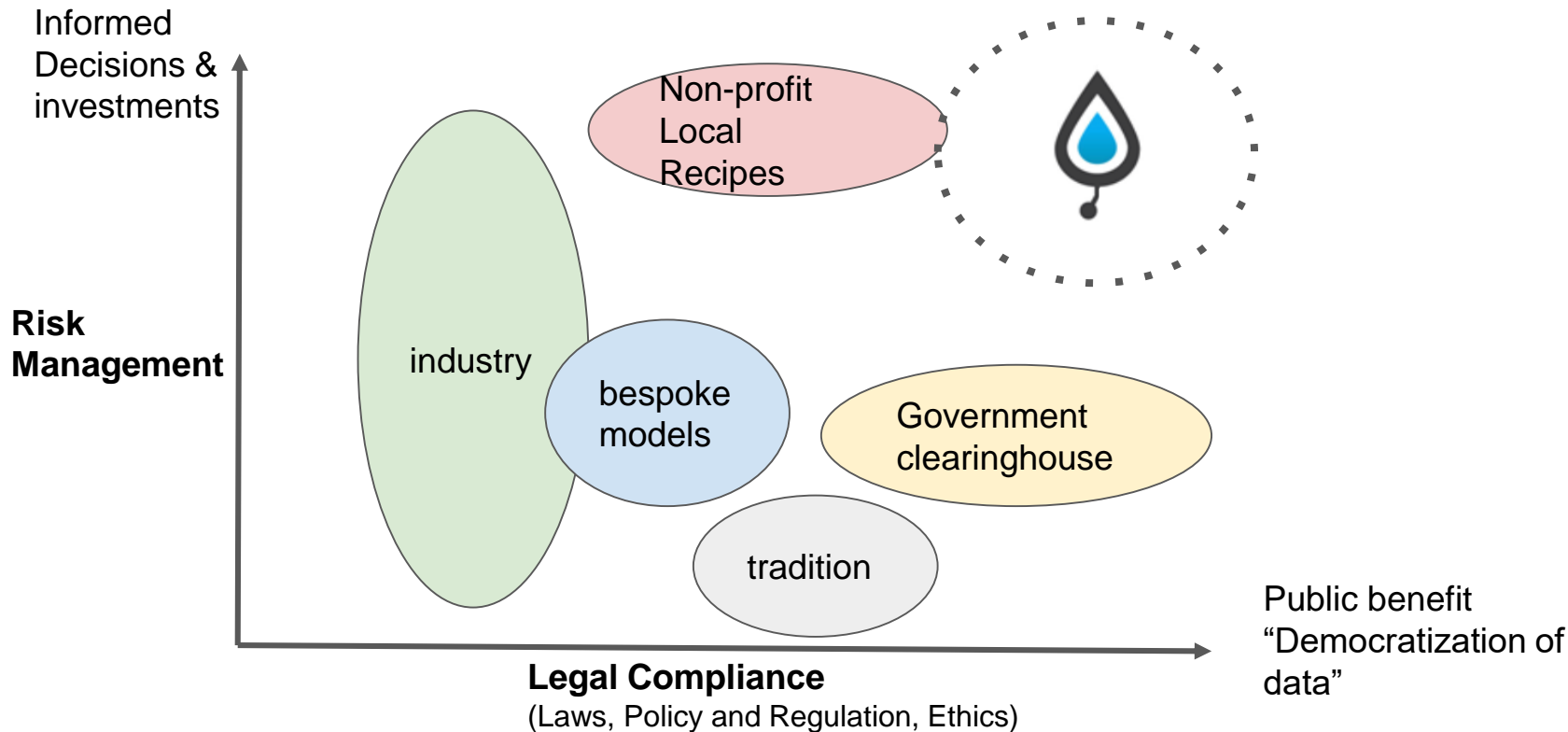
Water mesh subscribers have access to online Apps
that **create custom drinking water reports** that
support households data providers and clean water
infrastructure.



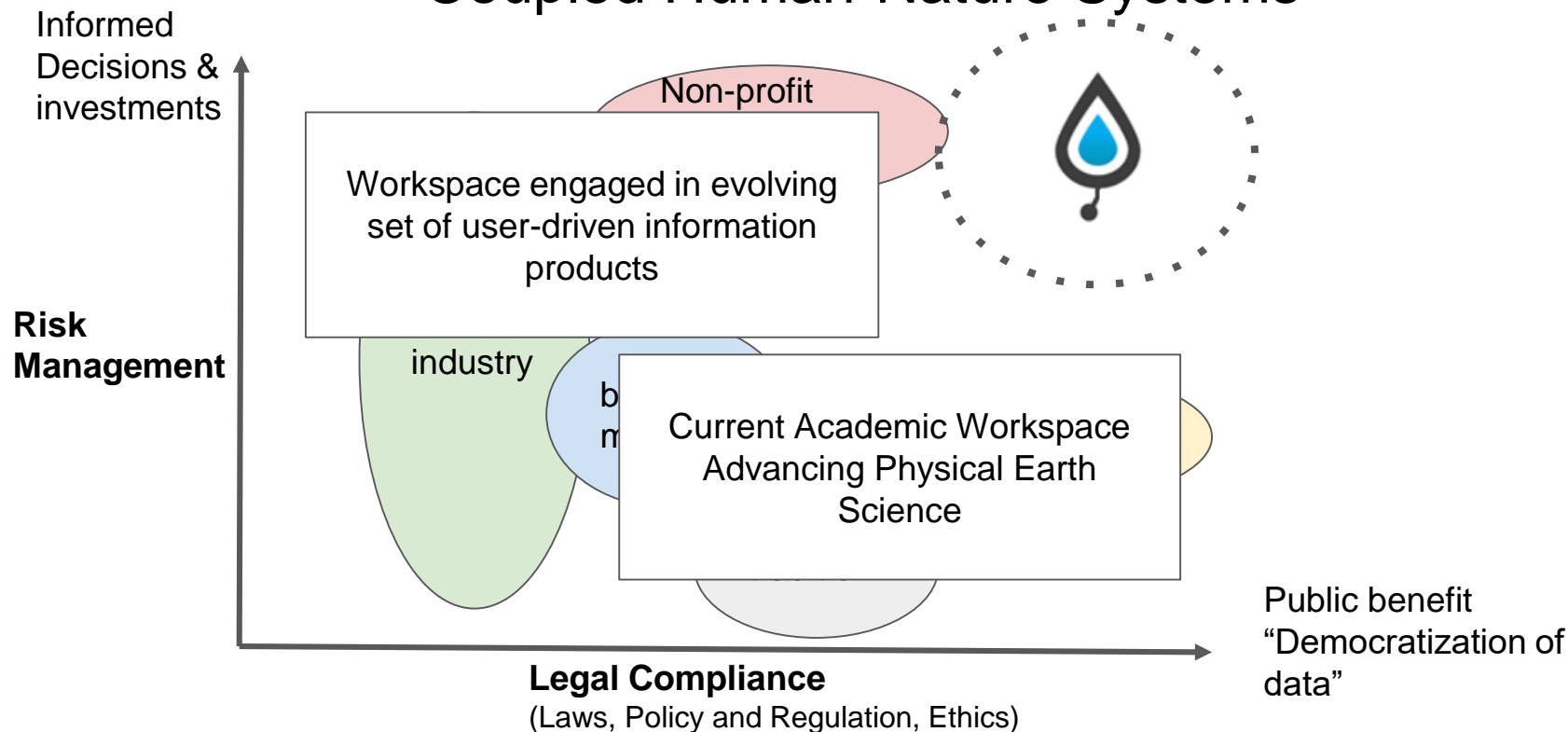
- Zero install for water quality samples and earth data analysis and mapping.
- Confidentiality of personal data
- Code to aggregate and translate big time-sensitive private datasets to assessments of risk for public benefits.



Market landscape



Scale-able Research Software for Earth informatics in Coupled Human-Nature Systems





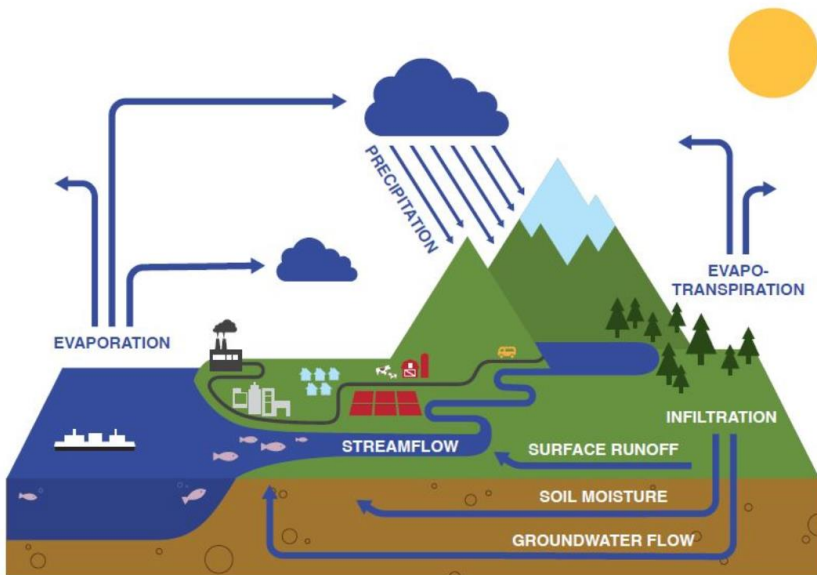
water sector non-profits

Data and Software Partners:

household data owners, academic water
sampling campaign leads, research
environmental engineers, public utilities
operators, water sample & audit industry,

water mesh

online infrastructure model



1. private data asset
2. community repository
3. software tools
4. compute resources
5. risk management product
6. public benefit

water mesh

Case Study 1



Situation: Puerto Rico's infrastructure vulnerabilities were highlighted after Hurricane Maria hit the island in September 2017.

water mesh

Case Study 1 vulnerable drinking water



1. Drinking water samples
2. HydroShare Groups
3. Landlab Toolkit
4. CUAHSI JupyterHub
5. Drinking water report with source area geo-risk and hurricane risk synthesis.
6. Rural water systems and public utilities enabled to anticipate hurricane risk and comply with Safe Drinking Water Act.

water mesh

Case Study 2



King Salmon Painting by Bob Patterson

Situation: Native American Tribes of the Pacific Northwest collect unique data assets critical for understanding environmental resources and critical endangered salmon habitat.

water mesh

Case Study 2 tribal resource sovereignty

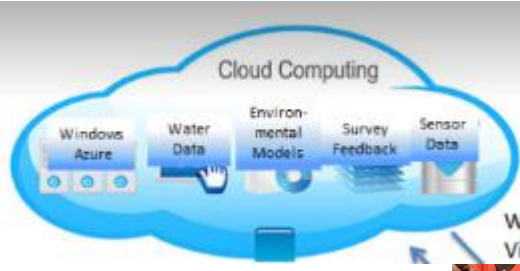


King Salmon Painting by Bob Patterson

1. Earth and biological observations
2. HydroShare Groups
3. National BioGeographic Map
4. ESIPhub
5. Land cover scenario reports with environmental risk synthesis.
6. Government planning experts ensure democratic and balanced decision-making

water mesh

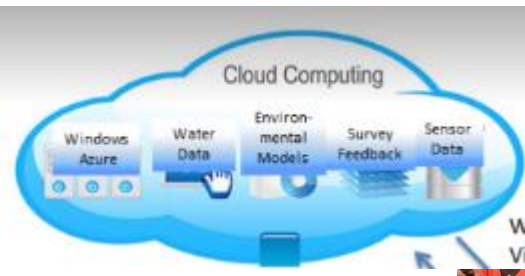
Proposed Case Study 3 rural water supply & food



Situation: Agricultural decisions depend on water and crop risk maps developed with real-time data sources from farmers, sensors, ground & surface water, and satellites.

water mesh

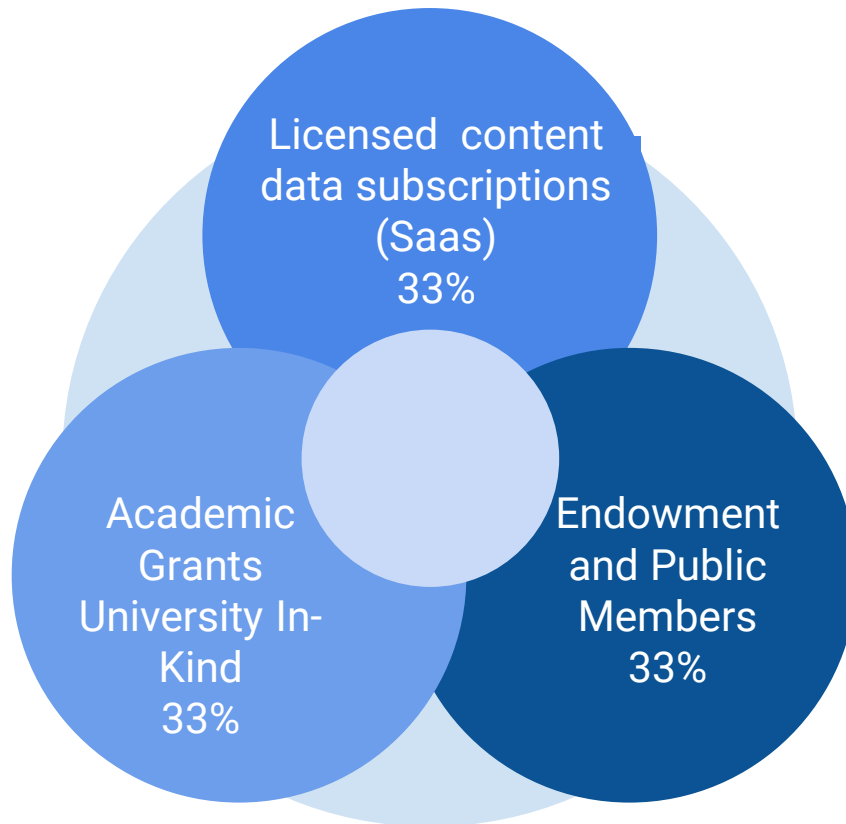
Case Study 3 rural water supply & food



1. soil probe, crop cover, water supply - field scale distributed data
2. CropScape
3. Geoweaver
4. commercial cloud
5. real-time crop maps and water table level reports.
6. integrated risk management optimized to support farmers.

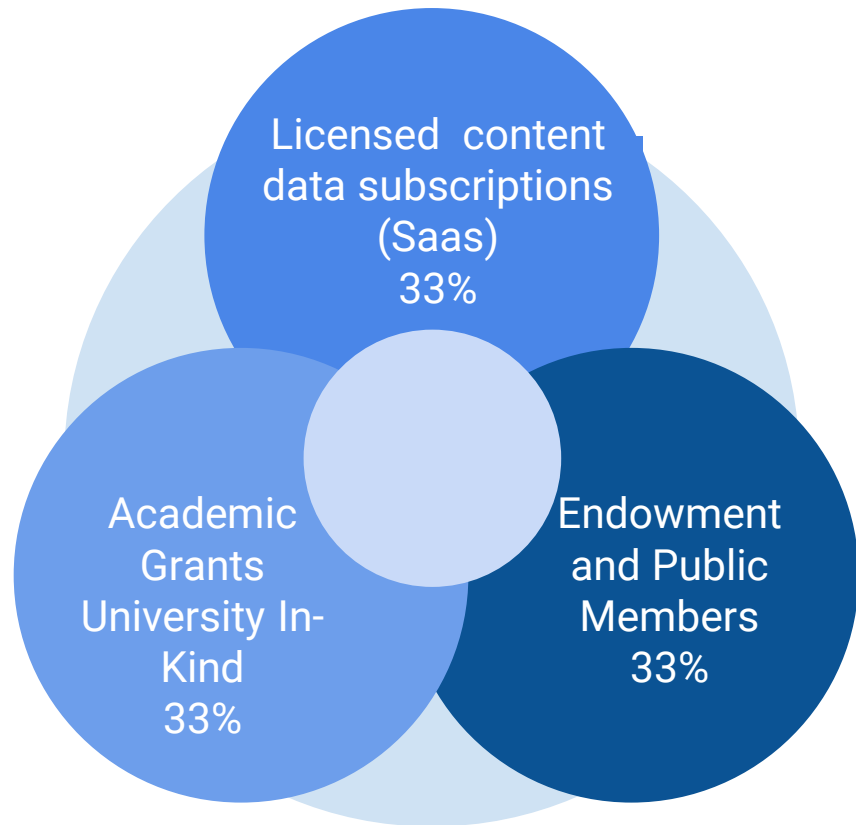


water mesh





tiered model



annual data subscription

\$100,000 global non-profit

\$ 10,000 local non-profit

\$ 1,000 public utility, academic research

endowment

10 million

One-time Donation: \$ 100

Annual recurrence: \$10/year

Donors: 50,000

Endowment match: 5 million

water mesh - 3 months



- develop prototype report for community water systems in Puerto Rico
- pilot business model for household data owners trained in cyber & water treatment plant operations
- present at Potable Water Symposium Feb, 2018; conduct user experience interviews with sample for local govt-wide scaling (from 6 to 240 utilities in PR)



water mesh - 6 months

- finalize prototype customizable reports for private and public
- test business model for utility and private company data owners trained in cyber & water treatment plant operations
- present at Natural Hazards Meeting July, 2019; conduct user experience interviews with sample for academic water campaign researchers for international scaling

water mesh

