Using Mobile Applications to Visualize Water Quality Data for Underserved Communities: An Overview of the Navajo WaterGIS Application

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Addressing community water quality concerns in unregulated sources

Context
Consumption of unregulated drinking water poses a public health concern because:
• No requirements for water quality testing (Backer and Tosta, 2011)
• Undetected contaminants – trace metals, radionuclides, microbial (DeSimone et al., 2009)
  • Metals exposure associated with:
    • Kidney and cardiovascular disease, diabetes, neurocognitive disorders and a variety of cancers

Objective
• Reach across institutional silos to consolidate and use water quality data for research and community engagement

Approach
• Collect available results, metadata, quality control
• Harmonize data and store in a relational geospatial database
• Statistical analysis using left-censored methods and spatial statistics/GIS
• Architecture informed by Indigenous Data Sovereignty Principles
Compiled water quality results from numerous sources

Water quality data collected by:

Navajo Nation Environmental Protection Agency

Southwest Research and Information Center

result: >70,000 chemical observations for 1,000+ UWSs, including quality control data for most
Developed a webGIS to provide data access and visualization

Key Features

- WebGIS application with spatial representation of tested UWSs
- Summary statistics for all available analytes per UWS
- Data repository - https://doi.org/10.6073/pasta/061a105b3eb79d9e4d53192f070b97f

https://unmcop.unm.edu/metrics/

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We are creating a mobile application for these water quality data.
Next Steps

• Continue developing these tools and deploy

• Conduct evaluation of tool effectiveness and impact on environmental health literacy for a variety of end users

• Track utility of the compiled dataset and use it to develop new community-based projects

Thank you!

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