

# Water Insecurity in Oregon?

Oregon Public Health Assn  
Annual Conference  
October 15, 2019



Environmental Public Health  
Curtis Cude & Cordelia Schimpf





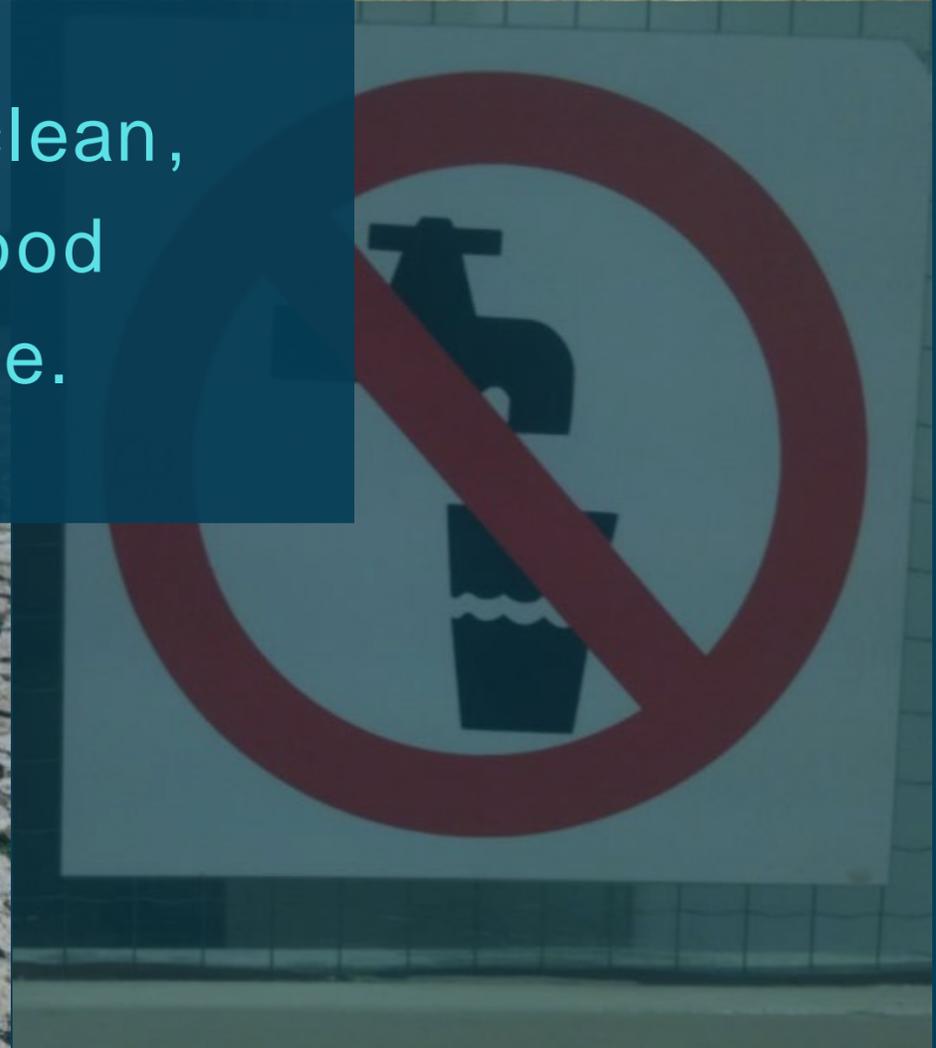
# WATER SECURITY

Adequate and/or equitable access to clean, safe and affordable water for drinking, food preparation, and sanitation and hygiene.



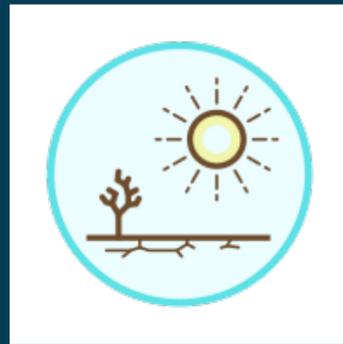
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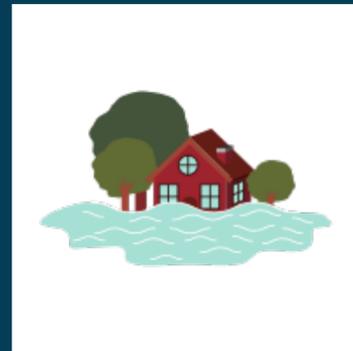


# KEY FACTORS AFFECTING WATER INSECURITY

## CLIMATE CHANGE



Droughts

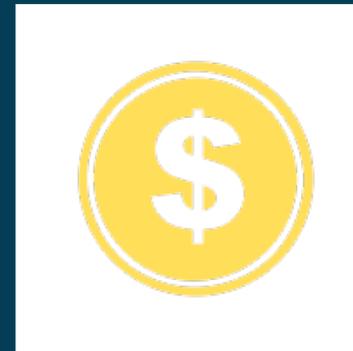


Floods

## SOCIAL



Population Distribution

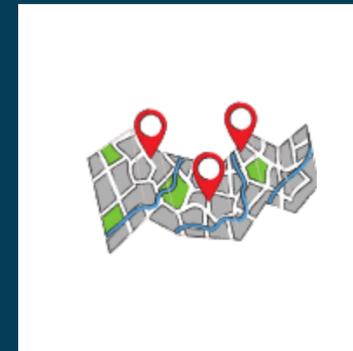


Socioeconomic Conditions

## PHYSICAL

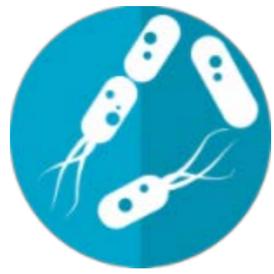


Housing



Geographic Location

# HEALTH OUTCOMES



Water-borne  
Illness



Exposure to  
Contaminants



Dehydration &  
Malnutrition



Poor Mental  
Health



**884 million**

LACK ACCESS TO SAFE  
DRINKING WATER



**2.5 billion**

USE UNIMPROVED SANITATION

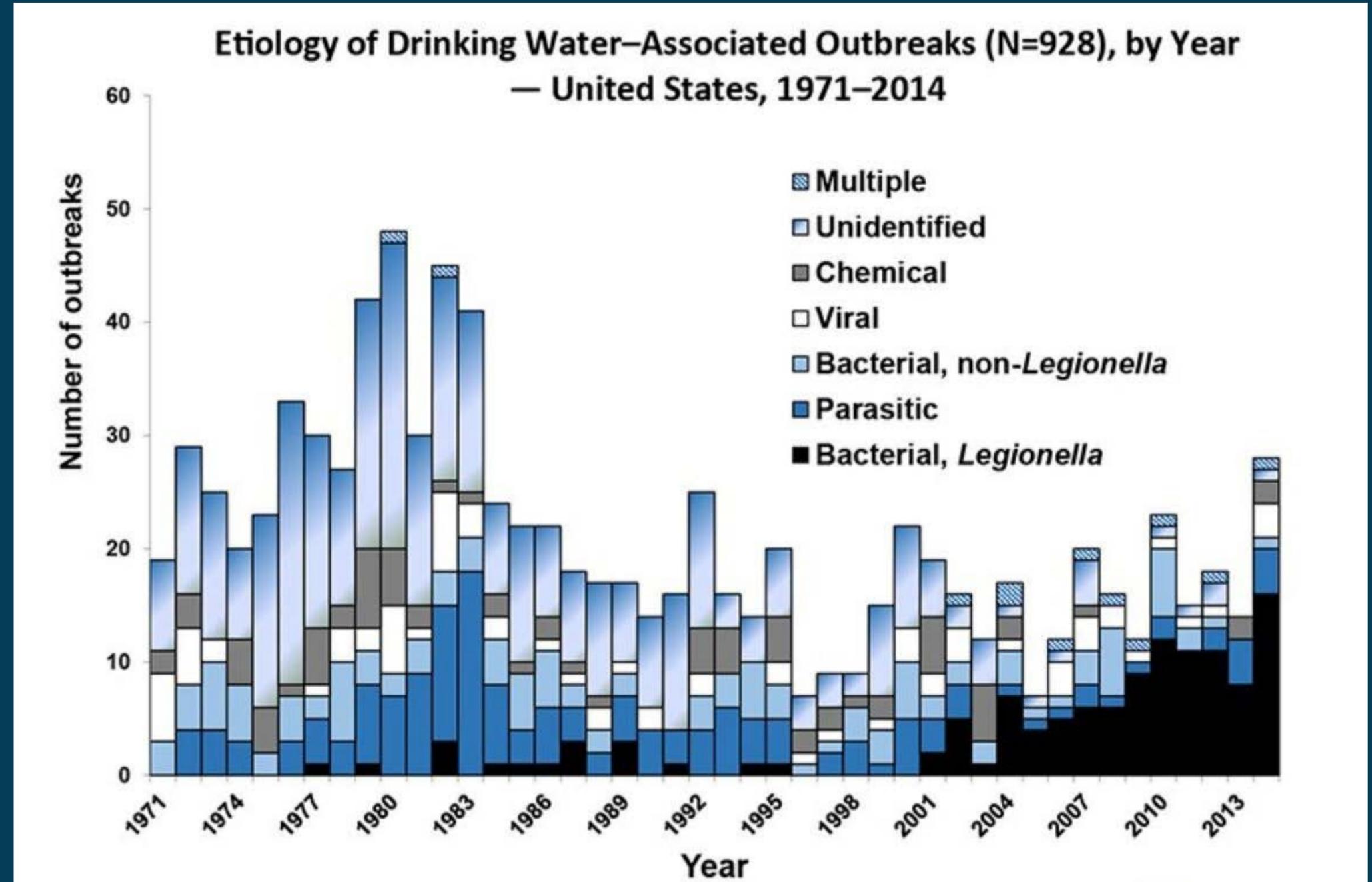


# The Human Right to Water and Sanitation (2010)

"WATER IS THE ESSENCE OF LIFE. SAFE DRINKING WATER AND SANITATION ARE INDISPENSABLE TO SUSTAIN LIFE AND HEALTH, AND FUNDAMENTAL TO THE DIGNITY OF ALL."

OFFICE OF THE UNITED NATIONS HIGH  
COMMISSIONER FOR HUMAN RIGHTS

# Drinking Water Disease Outbreaks

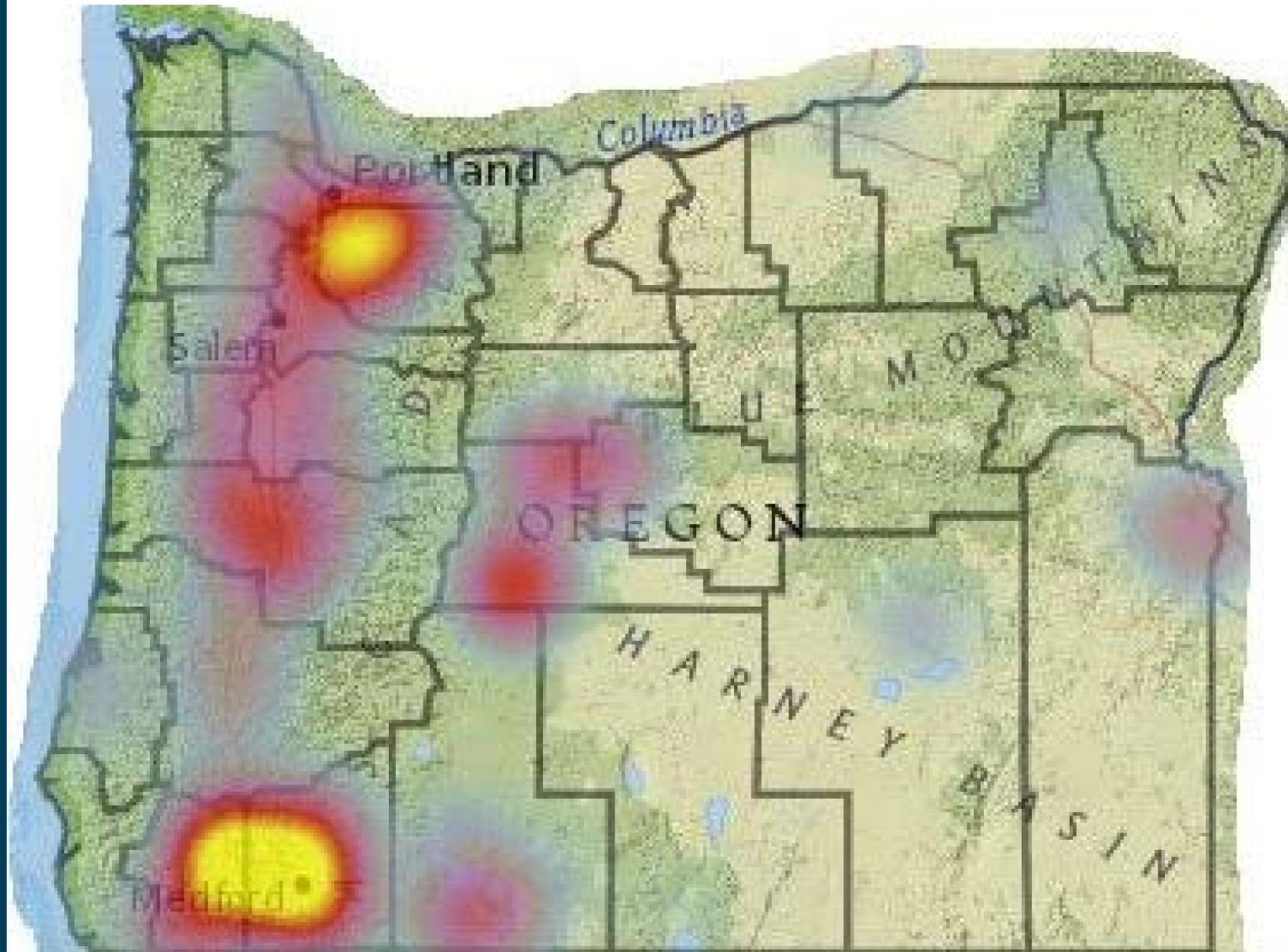


Waterborne Diseases & Outbreak Surveillance Reporting, by CDC, retrieved from <https://www.cdc.gov/healthywater/surveillance/drinking/2013-2014-figures.html>

# Drinking Water Exposures

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Heat map of arsenic in private wells: Domestic Well Testing Act data, 1989 - 2018



The yellow color represents the highest test results, blue the lowest, zero values are not shown.

# VULNERABLE COMMUNITIES



Populations experiencing homelessness



Tenants or low-income owners in residences with plumbing in poor condition



Populations situated in vulnerable flood plains

# VULNERABLE COMMUNITIES



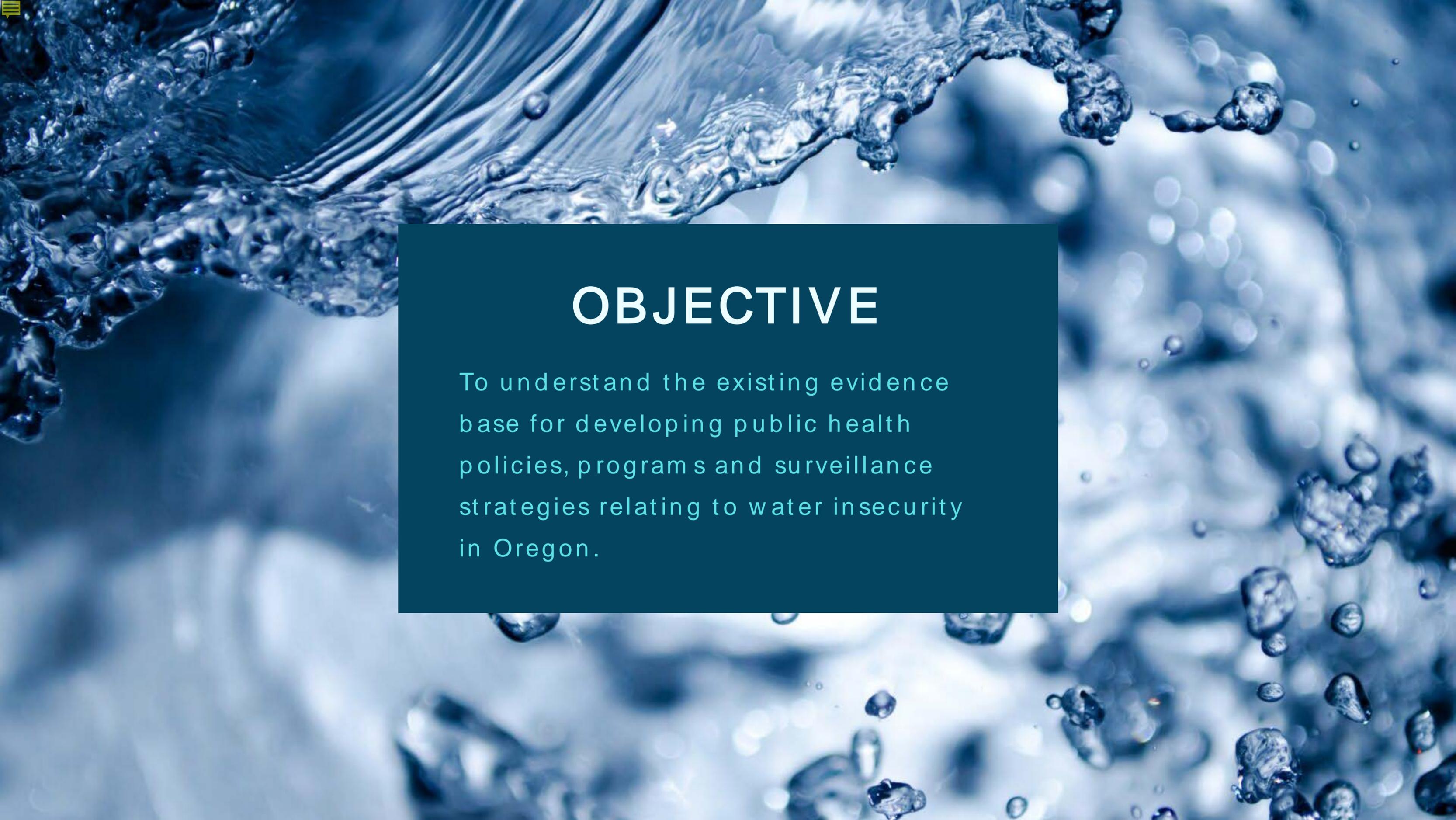
Counties with multiple consecutive drought declarations



Low-income communities with deteriorating drinking water infrastructure and limited resources to fund improvement



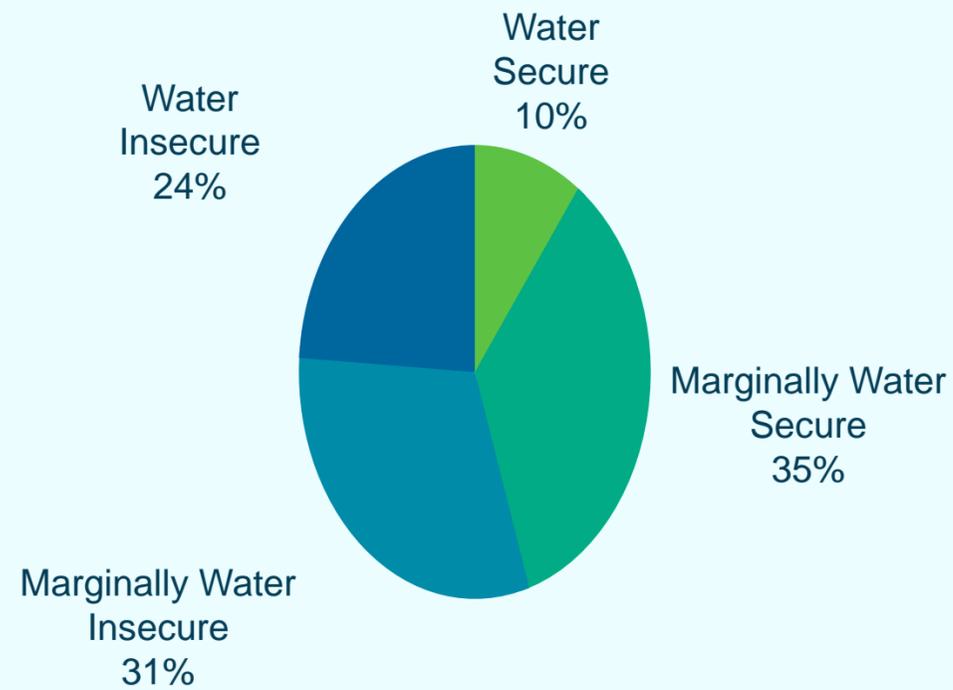
Coastal communities and community assets vulnerable to sea-level rise or saltwater intrusion

The background of the slide is a high-speed photograph of water splashing, creating numerous droplets and ripples. The water is a deep blue color. A dark teal rectangular box is centered on the page, containing white text.

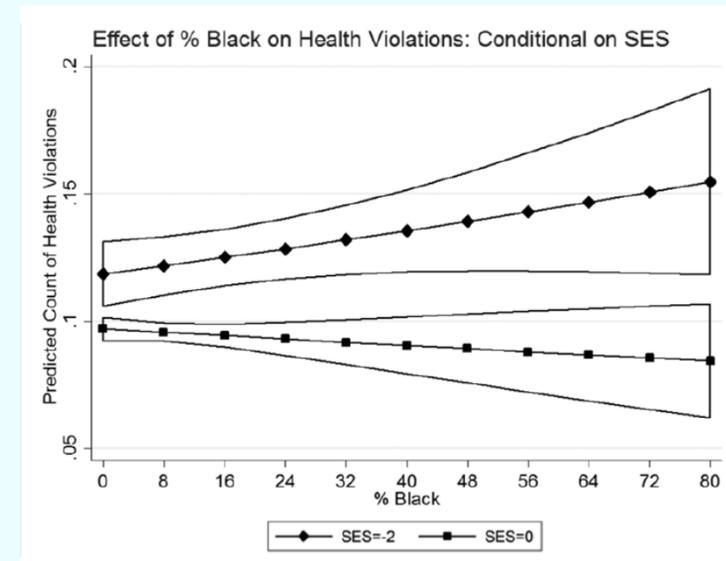
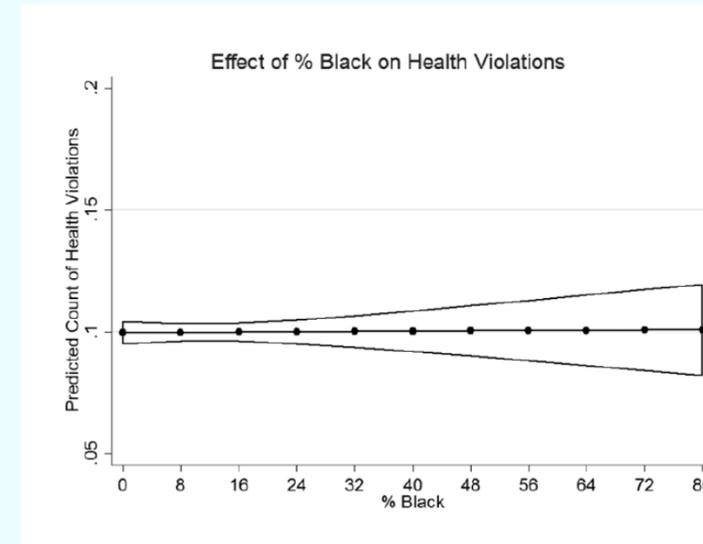
# OBJECTIVE

To understand the existing evidence base for developing public health policies, programs and surveillance strategies relating to water insecurity in Oregon.

# RESULTS - SURVEILLANCE



HOUSEHOLD WATER INSECURITY  
Jepson, 2014  
(Texas/Mexico border)



SES, Race/Ethnicity and SDWA COMPLIANCE  
Switzer & Teodoro, 2014  
(systems across the US)

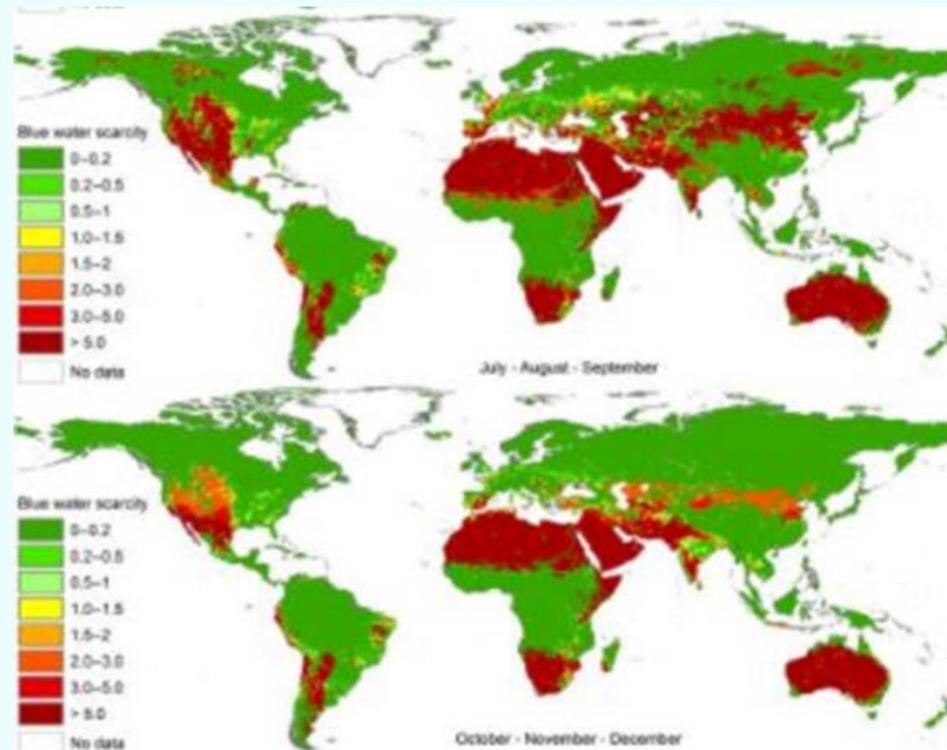


WATER SERVICE ACCESS  
Gibson et al., 2014  
(Wake County, North Carolina)

# RESULTS - SURVEILLANCE



WATER SERVICE  
RELIABILITY  
Pierce & Jimenez, 2015  
(American Housing Survey  
across the US)



WATER SCARCITY  
VARIABILITY MAPPING  
Mekonnen & Hoekstra, 2016  
(Global)

(2 of 5)

Public Water System Information

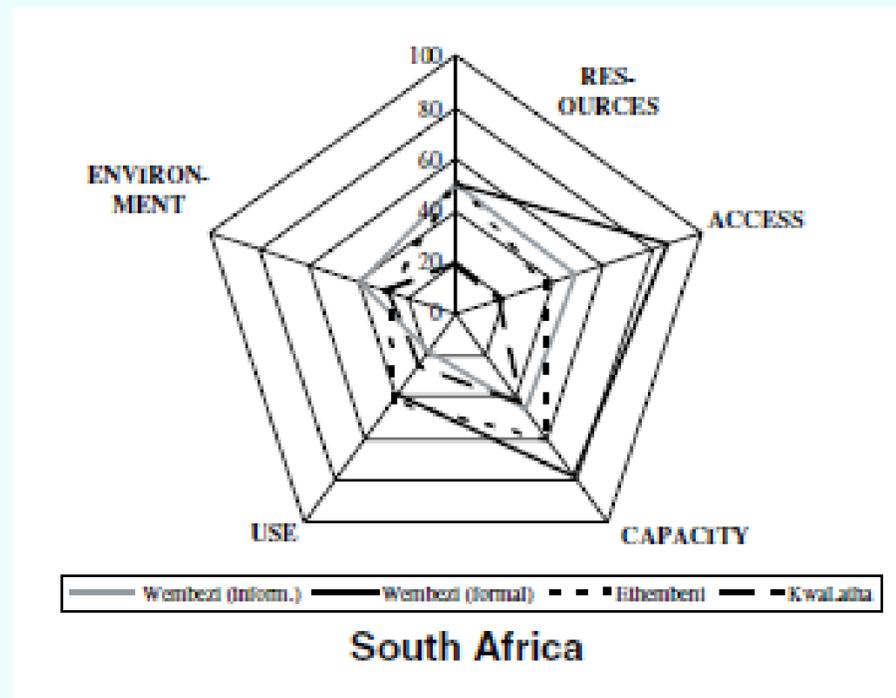
Water System No.	CA3410008
Water System Name	ELK GROVE WATER SERVICE
Regulating Agency	DISTRICT 09 - SACRAMENTO
County	SACRAMENTO
Population	40461
Service Connections	
Classification	COMMUNITY
City	ELK GROVE
Zip Code	95624
Compliance Status	IN COMPLIANCE

400m 30

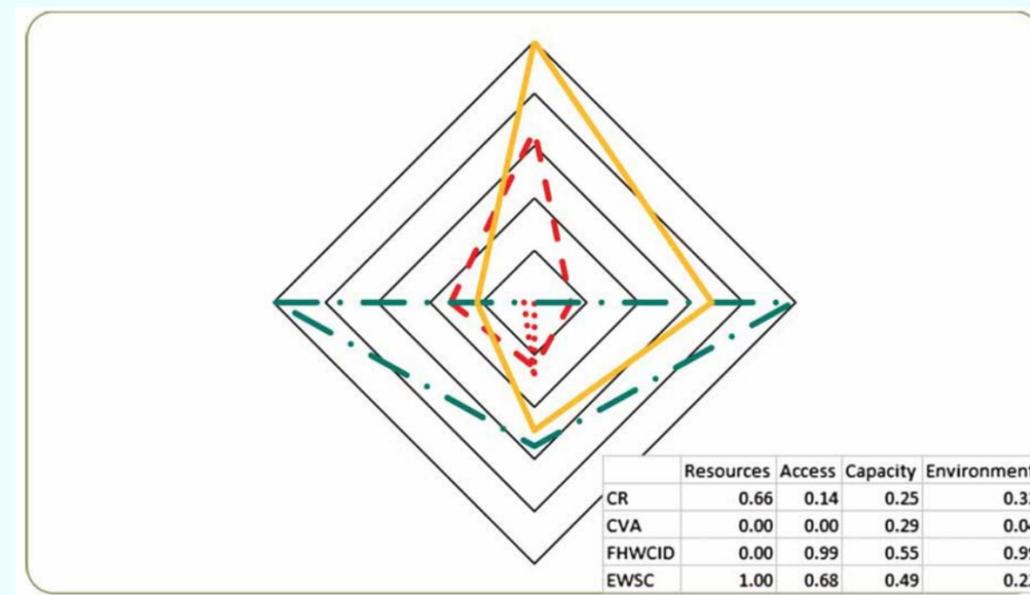
Find the Compliance Status here

EXCEEDANCE /  
COMPLIANCE MAPPING  
CA State Water Resources  
Control Board, 2019  
(California)

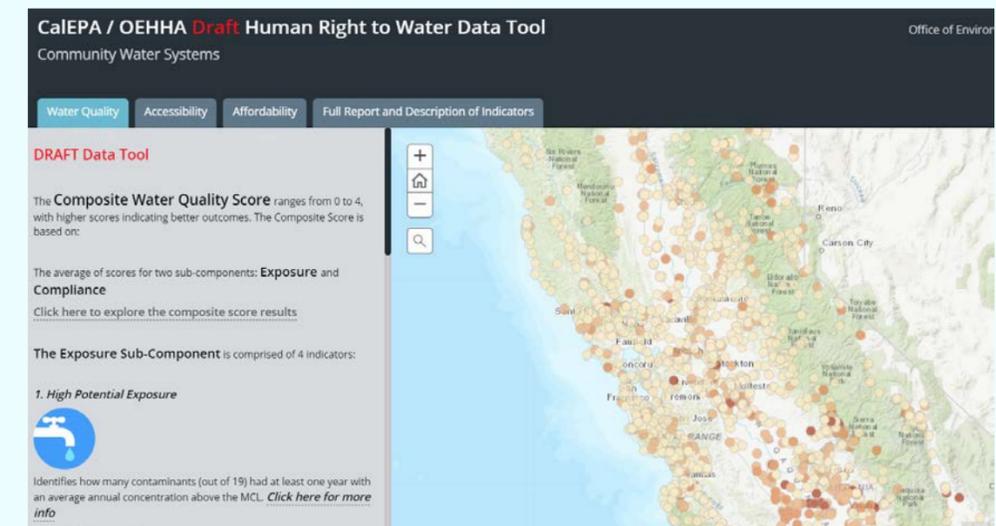
# RESULTS - INDICATORS



WATER POVERTY INDEX  
Pilot  
Sullivan, et al., 2003  
(South Africa, Tanzania, Sri Lanka)



WATER POVERTY INDEX  
Applied  
Korc & Ford, 2013  
(Texas/Mexico border)



FRAMEWORK TO EVALUATE  
HUMAN RIGHT TO WATER  
CA Office of Environmental  
Health Hazard Assessment, 2019  
(California)

# RESULTS

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## Policy



## CALIFORNIA HUMAN RIGHT TO WATER ASSEMBLY BILL (AB 685)

California Water Boards, 2012

"Every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes (State of California, 2012)."

\*Affordability: water expenses should not exceed 3-5% of household income



# CALIFORNIA

- California's Human Right to Water Law followed mobilization of multiple communities & NGOs focused on water justice
- Assessing water security needs, setting goals, developing resources, improving water affordability and tracking progress

# WASHINGTON

- Pursuing water insecurity interventions through community education events, drought risk assessment, water loss detection and utility rate capping.
- Aim to increase awareness of the value of water & importance of water conservation





# OREGON

- OWRD leads ongoing efforts to:
  - implement an Integrated Water Resources Strategy
  - gain a better understanding of the quantity and quality of water in aquifers to prepare for droughts
  - capture groundwater-level data and climatic and seasonal impacts on aquifers
  - engage local communities in place-based planning approaches of IWRM and
  - Develop a 100-year vision for water in Oregon
- The DEQ conducts groundwater studies
- Partner agencies of Oregon's Integrated Water Resources Strategy conducted a drought response survey across the state

# RECOMMENDATIONS

## CHARACTERIZE POPULATIONS EXPERIENCING INEQUITIES IN ACCESS TO WATER

Study census and property tax data to identify, describe, and quantify inequities in access to water

Map Oregon water systems as done in California's Exceedance/Compliance mapping tool, and consider inclusion of water system advisories

## IDENTIFY WATER INSECURITY NEEDS

Assess water insecurity experiences and needs (water access, quality, affordability, and water affect) at the household level using HWI surveys/scaograms

Assess water service reliability in manufactured/mobile home parks using American Housing Survey (AHS) questions integrated into HWI surveys

# RECOMMENDATIONS

## TRACK WATER SCARCITY VARIABILITY

Implement strategies to better understand how climate change and seasonal variability impacts water availability and drought risk by applying Mekonnen and Hoekstra's water scarcity modeling approach.

## PURSUE THE HUMAN RIGHT TO WATER

Adopt a state policy, such as the human right to water, that would encourage collaboration between public health agencies, water resources management agencies, academia and policymakers to establish accessible, safe and affordable water as a priority in future policy decisions.

# Thank you

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