Solutions for Underperforming Water Systems

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THE Water Research FOUNDATION

CALIFORNIA URBAN WATER AGENCIES

Overview

Part 1: Project Background

Part 2: Preliminary Results

- Toolbox
- Data Analysis
- Case Studies

Part 3: Next Steps

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Project Partners

Pacific Institute, California Urban Water Agencies (CUWA), and Water Research Foundation (WRF) are nonprofit organizations dedicated to solving water challenges with high-quality technical information.

We have different organizational histories and strategies, but we share the belief that everyone should have safe, affordable, accessible tap water, and that communication across interest groups can help achieve that goal.

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Timeline

Site Visit: March 2019

First Advisory Committee Meeting: March 2019

Data Analysis Commenced: April 2019

Thought Leaders Workshop: May 2019

Preliminary Results: Late Summer 2019

Final Report: Spring 2020

Research Goal

Develop a systematic approach to identifying solutions for small underperforming drinking water systems.

Approach

The Toolbox: Identify the criteria that distinguishes a system as a potential candidate for a solution.

Data Analysis: Identify hotspots for drinking water challenges, and regions for water partnerships.

Case Studies: Link 33 persistently underperforming systems with potential solutions.

Policy Recommendations: Make policy recommendations on how to improve the enabling environment for small water system compliance, with a special eye to the role of high-performing water utilities in water partnerships.

What This Project Doesn't Do

We are not weighing in on how to fund the unmet financial needs of small water systems.

Regardless of where the funding comes from, it is important to begin thinking about how to implement solutions.

Building on Recent Research

Pacific Institute 2018, *Measuring Progress on Universal Access to Water and Sanitation in California*

- Service ladder approach to ranking water quality

CUWA 2019, Issue Brief on Restoring Water Accessibility

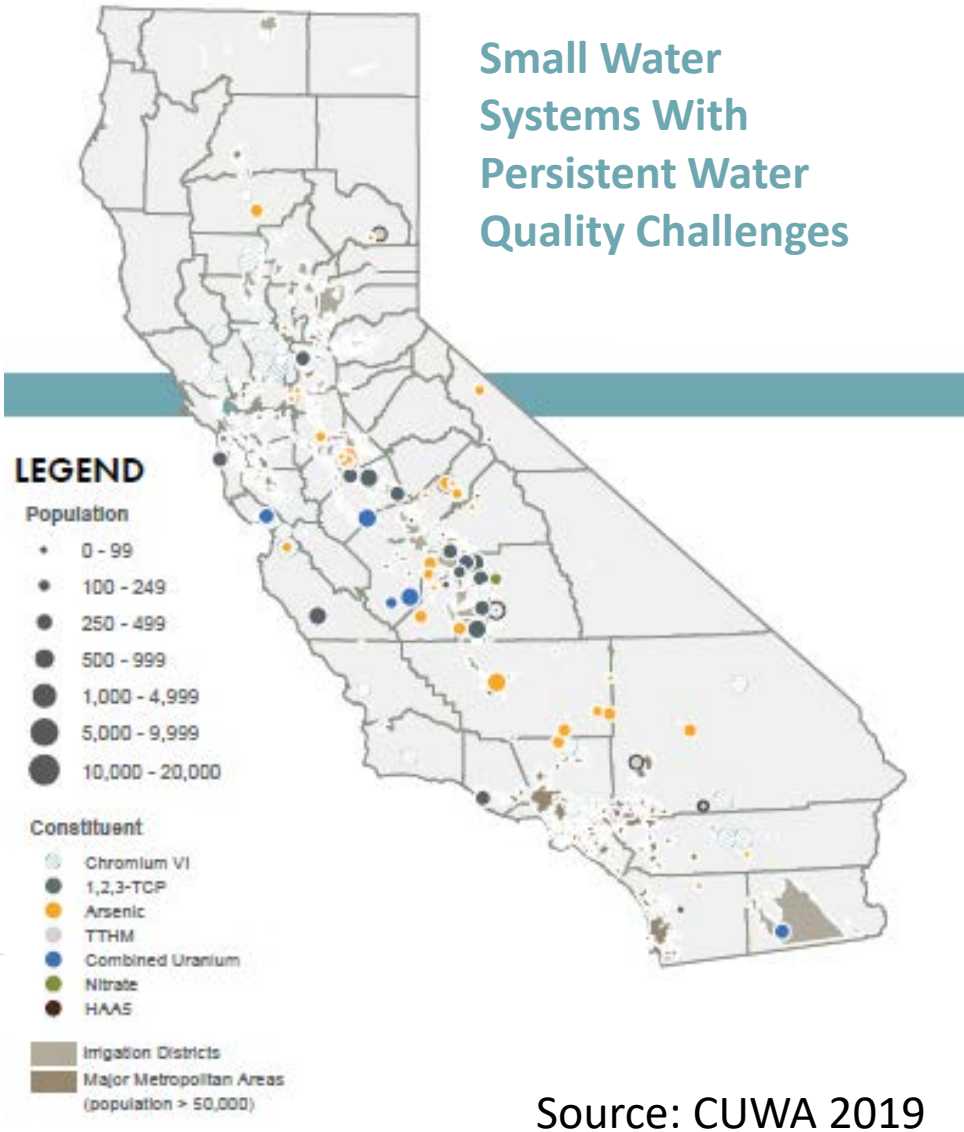
- Classified small water systems by persistence of violations

WRF 2019 (in review), *Water Utility Partnerships: Resource Guide and Toolbox*

- How to increase political will for voluntary water partnerships

Small Water Systems and Safe Water

- Of 2,943 community water systems in California, 2,509 (85%) serve under 10,000 people.
- Many have difficulty complying with the Safe Drinking water Act.

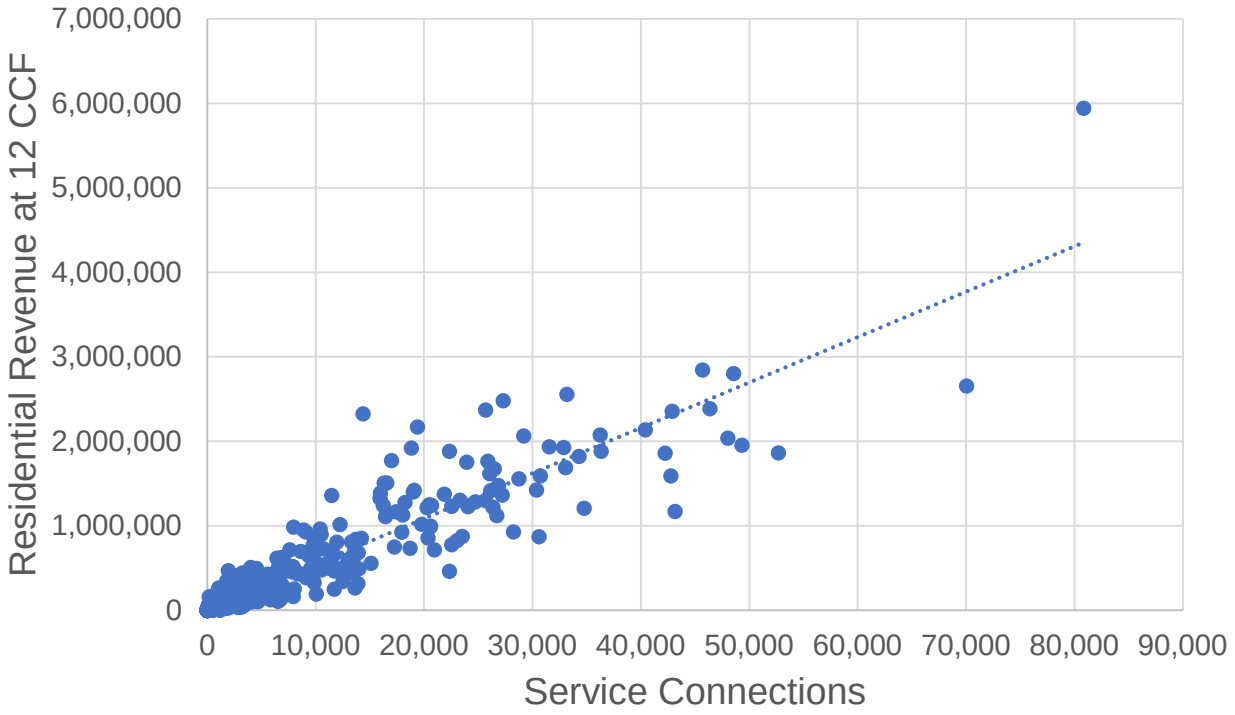


Source: CUWA 2019

Technical, Managerial, and Financial Capacity

Revenue tends to correlate with number of paying accounts.

Smaller systems need to deliver safe water with more limited financial capacity.



Predicted residential revenue at 12 CCF based on connections and cost of 12 CCF drinking water.
Source: CA Water Board 2017 eAR

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What are the tools?

1. Physical Consolidation
2. Managerial Consolidation

} Water Partnerships

3. Management Reform
4. New Water Supply
5. Optimize Existing Treatment System
6. Capital Improvements to Treatment Systems
7. Point of Entry or Point of Use Treatment Systems

What are the tools?

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Definition: Water System Partnerships

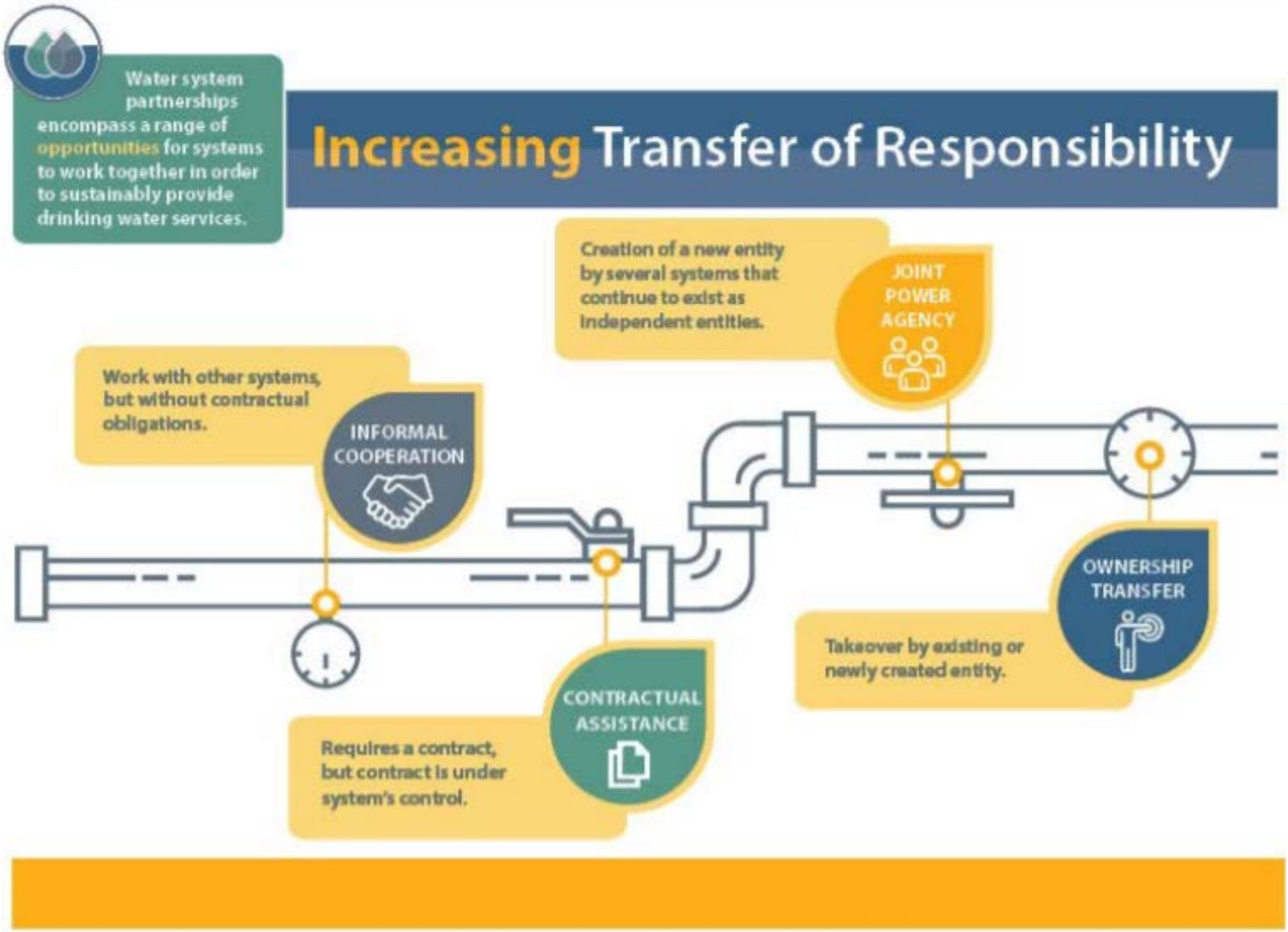


Figure 1. Partnerships Spectrum

Source:
US EPA, 2017

Definition: Small Water Systems

Community and Non-Transient Non-Community Water Systems serving under 10,000 people

Definition: Disadvantaged Unincorporated Communities

Disadvantaged Unincorporated Communities (DUCs) are settled, low-income, rural areas that are either not identified as Census Designated Places (CDP) in the 2010 Census, or are small communities within a comparatively wealthy CDP.

The DUC map was last updated in 2013.

Source: PolicyLink, UC Davis Center for Regional Change

Performance Categories

- Created four categories, from Satisfactory to Unsatisfactory
- Considered short-term acute violations as a greater health risk than short-term chronic violations
- Considered long-term violations a greater risk than short-term violations

Model approach: United Kingdom Drinking Water Inspectorate Compliance Risk Index (Rink *et al.* 2019)

Definition: Performance Categories

Satisfactory: No Out of Compliance (OOC) quarters

Moderate: No OOC quarters for acute analytes, no more than 1 OOC quarter for a single chronic analyte

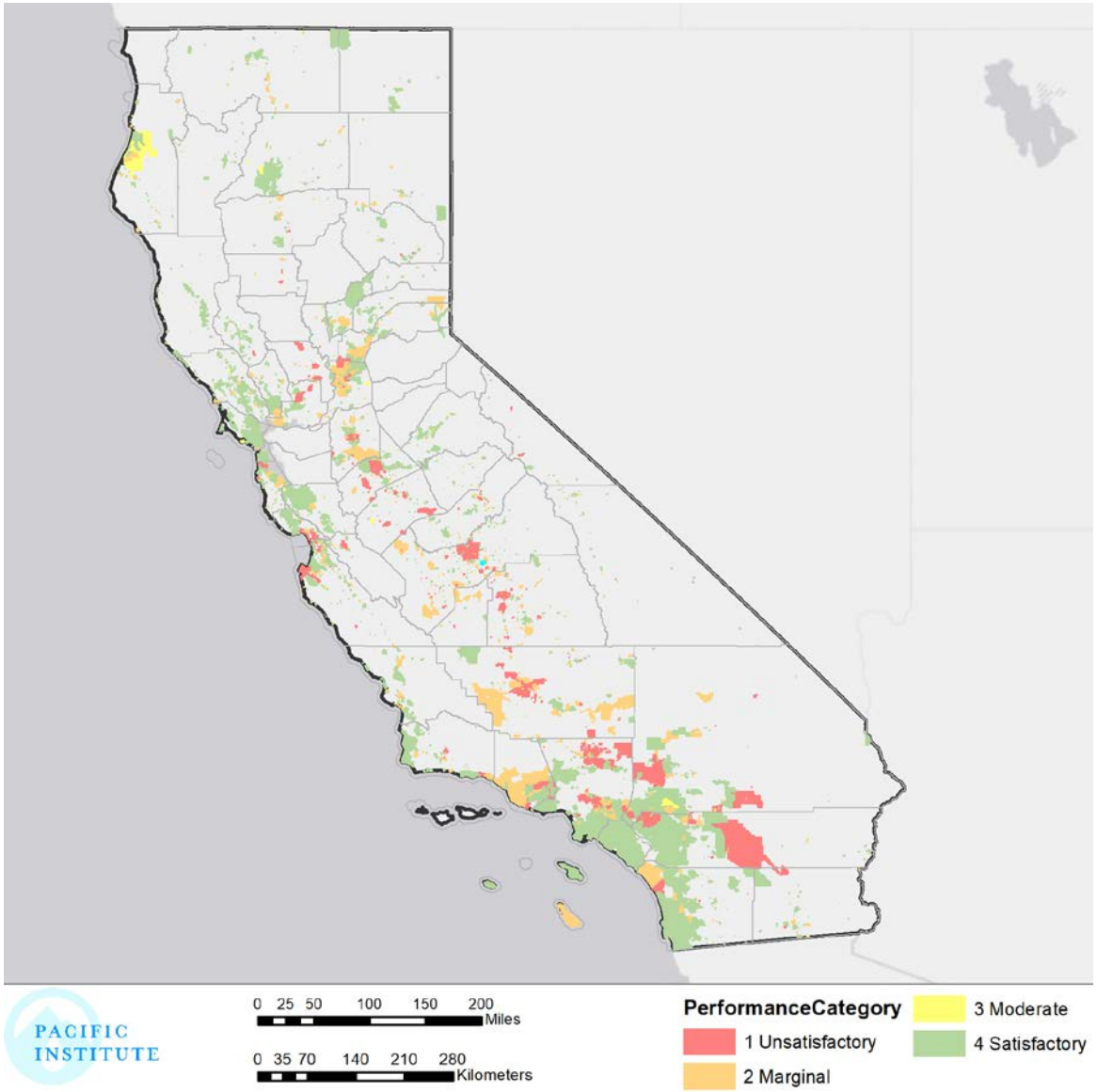
Marginal: between 1-11 OOC quarters for any one analyte (acute or chronic)

Unsatisfactory: ≥12 quarters OOC for any one analyte (acute or chronic)

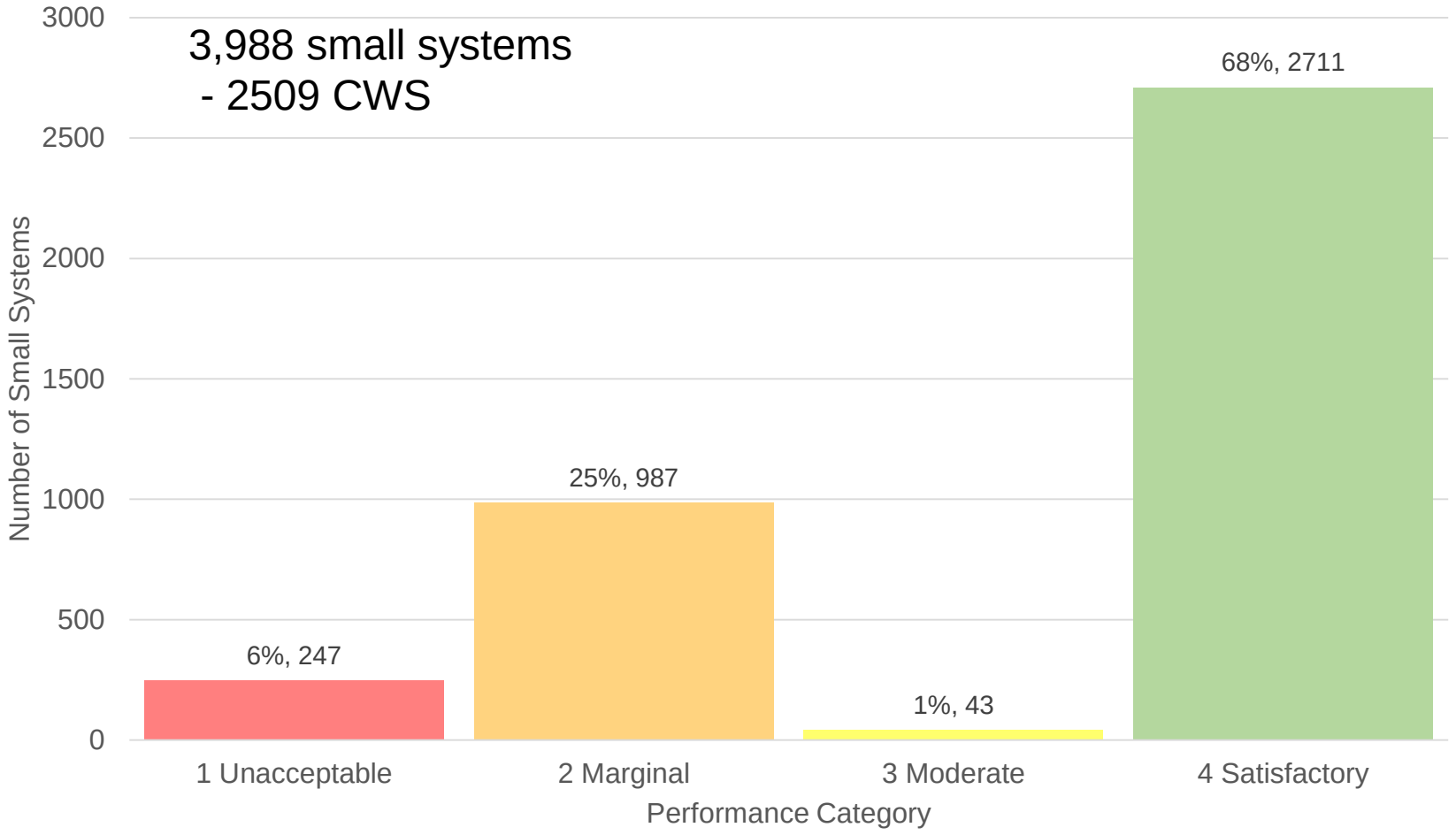
… out of four years (20 quarters)

System by Performance Category

3,988 small systems (CWS and NTCWS) serving 2.6 million Californians



Number of Small Systems



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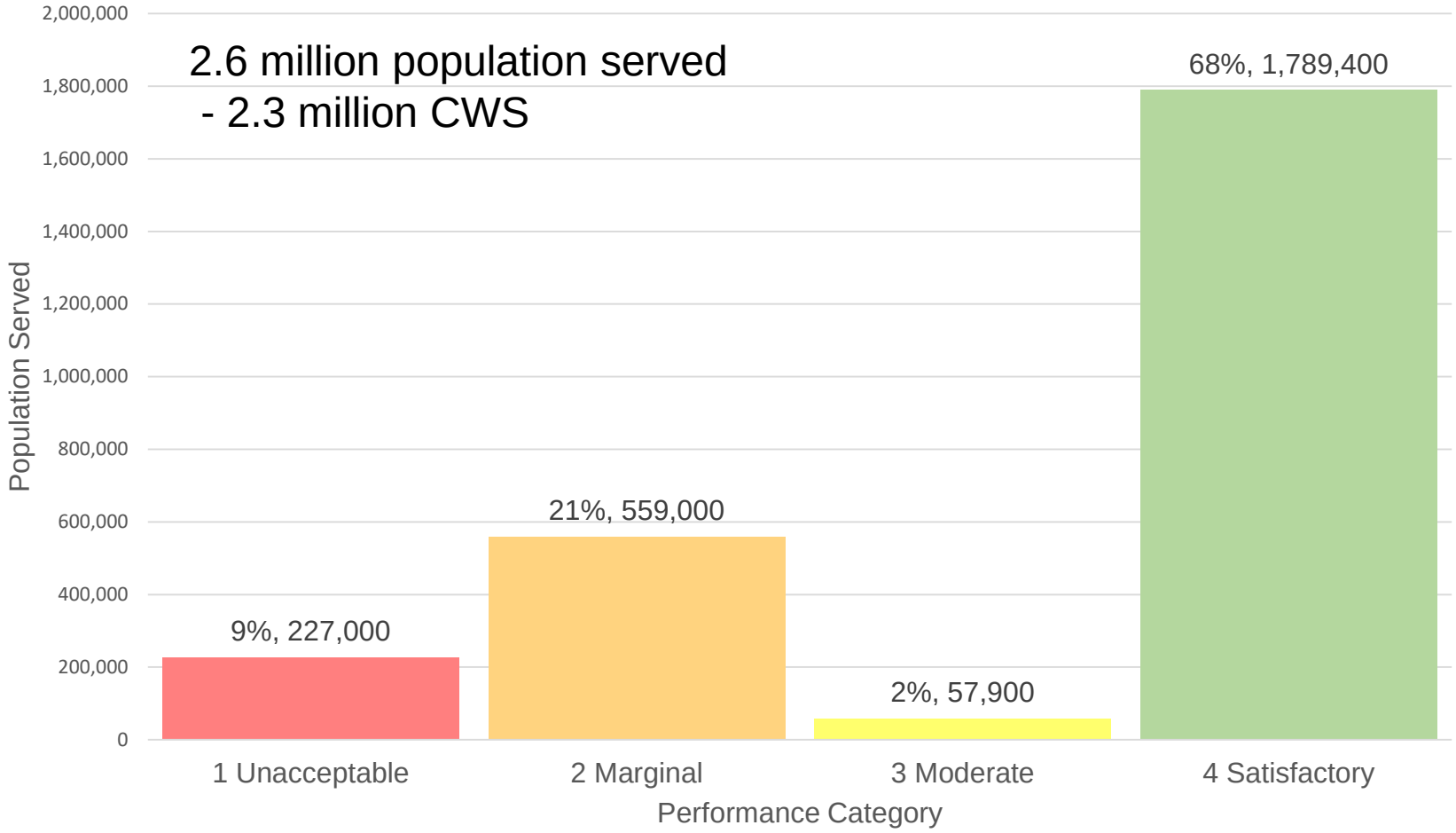
Population Served by Small Systems



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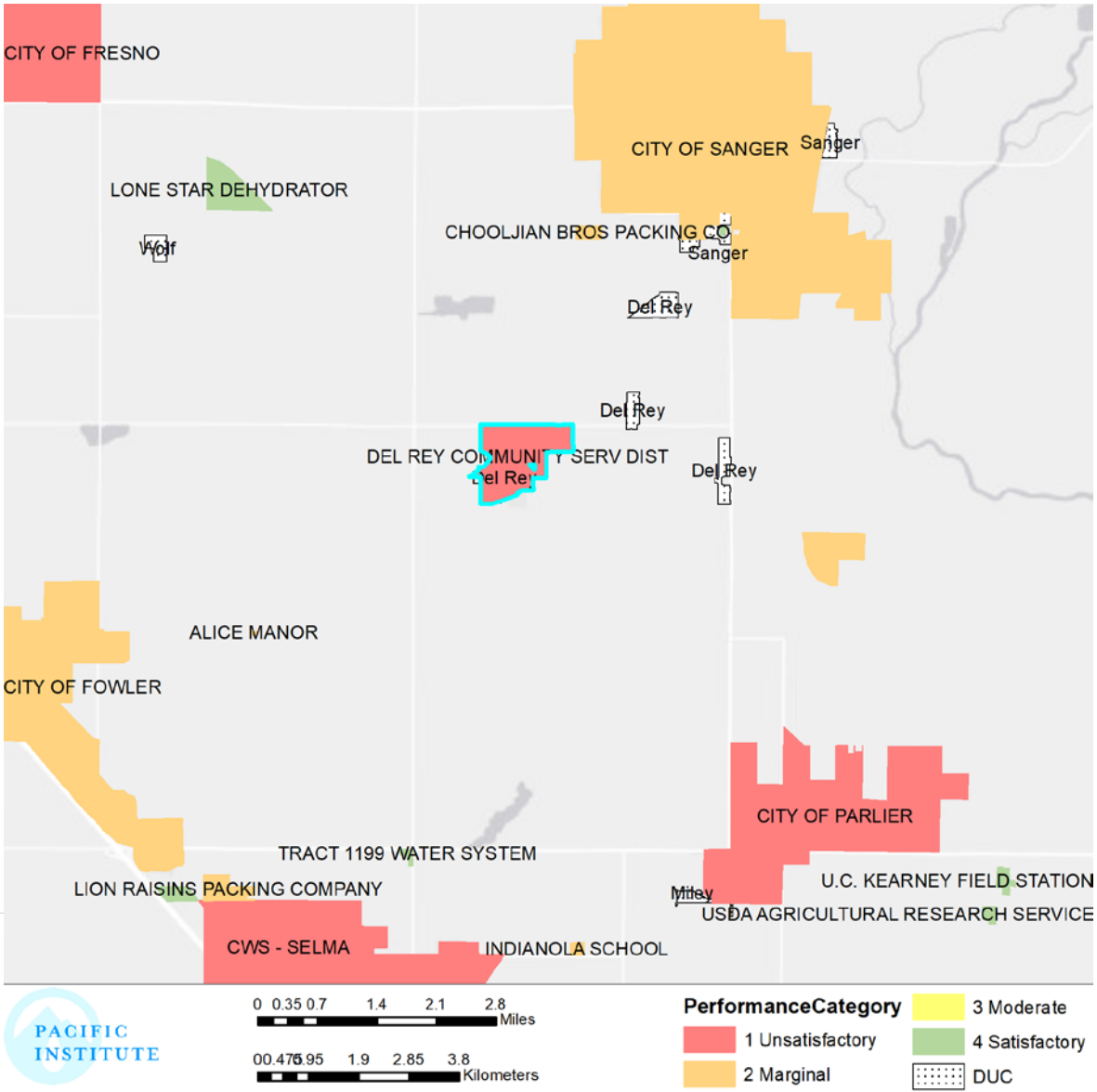
Spatial Analysis

Questions to Address:

For systems with unacceptable quality drinking water, how many water systems are within a reasonable partnership range?

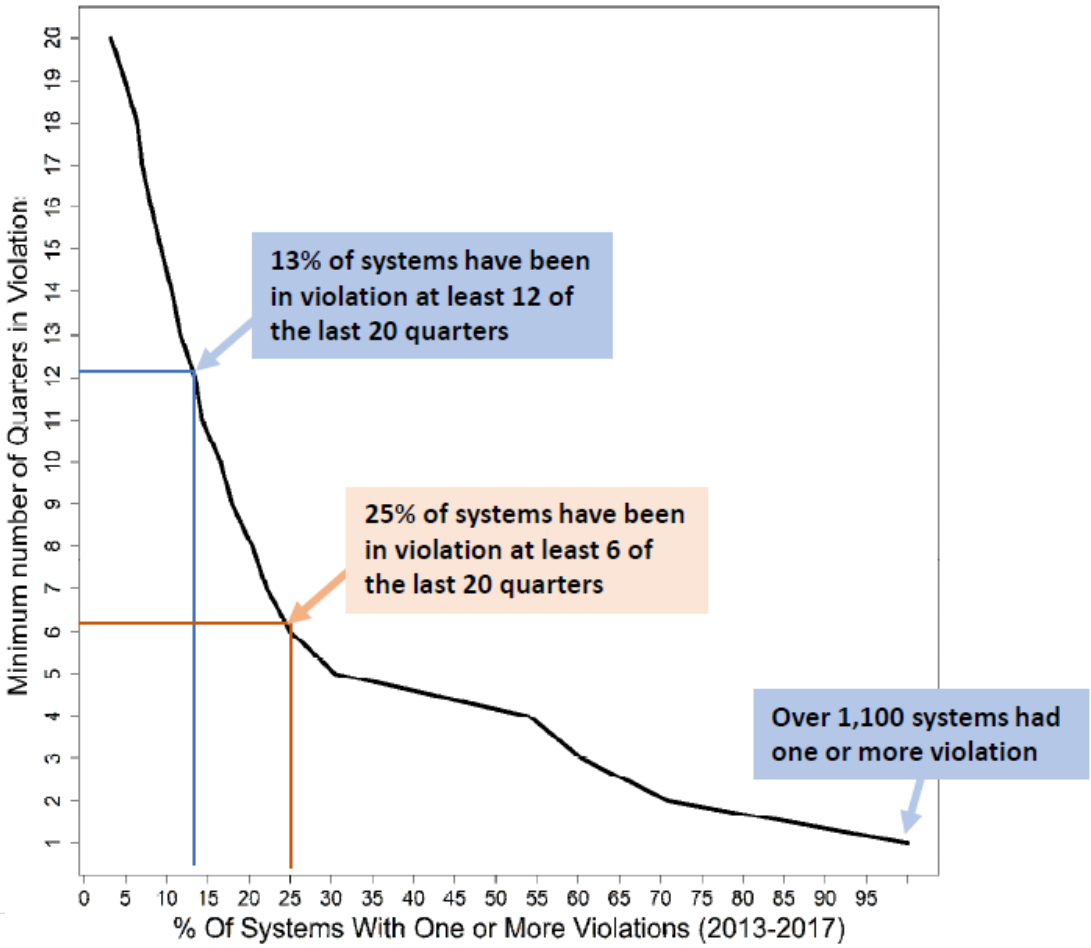
Are there key areas to target for partnership zones?

Do partnership zones intersect with DUCs?



Why did we pick these 33?

- Focused on systems in the "unacceptable" category
- Focused on systems with >200 connections, which served 80% of the population served in the "unacceptable" category



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33 Case Studies

Water System Name	County	City	Contaminant	# quarters out of compliance	Population Served	# of service connections
CARUTHERS COMM SERV DIST	Fresno	CARUTHERS	ARSENIC	20	2,503	681
DEL REY COMMUNITY SERV DIST	Fresno	DEL REY	1,2,3-TCP	20	1,500	328
HURON, CITY OF	Fresno	HURON	TTHM	20	7,306	908
SEELEY CWD	Imperial	SEELEY	TTHM	20	2,124	463
GREENFIELD COUNTY WD	Kern	BAKERSFIELD	ARSENIC	20	9,900	2,660
BORON CSD	Kern	BORON	ARSENIC	19	2,253	599
NORTH EDWARDS WD	Kern	NORTH EDWARDS	ARSENIC	15	600	217
RAND COMMUNITIES WATER DISTRICT	Kern	RANDSBURG	ARSENIC	20	450	260
KETTLEMAN CITY CSD	Kings	KETTLEMAN CITY	ARSENIC	20	1,450	354
LEISURE LAKE MOBILE ESTATES	Los Angeles	CHANDLER	1,2,3-TCP	12	280	211
LAND PROJECTS MUTUAL WATER CO.	Los Angeles	LANCASTER	ARSENIC	20	1,500	539
HILLVIEW WC-OAKHURST/SIERRA LAKES	Madera	OAKHURST	ARSENIC	20	3,818	1,166
HILLVIEW WC-OAKHURST/SIERRA LAKES	Madera	OAKHURST	COMBINED URANIUM	20	3,818	1,166
CITY OF DOS PALOS	Merced	DOS PALOS	TTHM	16	7,452	2,581
HILMAR COUNTY WATER DISTRICT	Merced	HILMAR	1,2,3-TCP	12	4,850	1,570
LE GRAND COMM SERVICES DIST	Merced	LE GRAND	1,2,3-TCP	20	1,700	455
WINTON WATER & SANITARY DIST	Merced	WINTON	1,2,3-TCP	20	8,500	2,900
BRIDGEPORT PUD	Mono	BRIDGEPORT	ARSENIC	18	850	281
JUNE LAKE PUD VILLAGE	Mono	JUNE LAKE	1,2,3-TCP	14	240	281
FORT HUNTER LIGGETT	Monterey	Fort Hunter Liggett	1,2,3-TCP	13	5,500	209
CALAM - WEST PLACER	Placer	SACREMENTO	1,2,3-TCP	13	3,188	2,016
PLUMAS EUREKA CSD	Plumas	BLAIRSDEN	ARSENIC	14	325	546
GRIZZLY LAKE CSD-DELLEKER	Plumas	PORTOLA	COMBINED URANIUM	19	657	330

33 Case Studies (Continued)

Water System Name	County	City	Contaminant	# quarters out of compliance	Population Served	# of service connections
MONTARA WATER AND SANITARY DISTRICT	San Mateo	MONTARA	1,2,3-TCP	19	4,374	1,653
HUGHSON, CITY OF	Stanislaus	HUGHSON	ARSENIC	18	6,082	1,806
KEYES COMMUNITY SERVICES DIST.	Stanislaus	KEYES	1,2,3-TCP	20	4,805	1,482
KEYES COMMUNITY SERVICES DIST.	Stanislaus	KEYES	ARSENIC	20	4,805	1,482
LOS MOLINOS COMM. SERVICES DIST.	Tehama	LOS MOLINOS	ARSENIC	12	1,500	352
ALPAUGH COMMUNITY SERVICES DISTRICT	Tulare	ALPAUGH	ARSENIC	16	1,026	379
DEL ORO RIVER ISLAND SERV TERR #1	Tulare	CHICO	COMBINED URANIUM	15	1,580	416
LONDON COMMUNITY SERV DIST	Tulare	DINUBA	1,2,3-TCP	20	2,138	439
EARLIMART PUD	Tulare	EARLIMART	1,2,3-TCP	19	8,300	1,568
IVANHOE PUBLIC UTILITY DIST	Tulare	IVANHOE	1,2,3-TCP	20	4,495	1,113
OROSI PUBLIC UTILITY DISTRICT	Tulare	OROSI	1,2,3-TCP	20	8,770	1,628
WOODVILLE PUBLIC UTILITY DIST	Tulare	WOODVILLE	1,2,3-TCP	19	1,673	483

Case Studies: 33 Systems

In the Unacceptable Category, 33 systems serve more than 80% of the population.

Questions:

- Which are candidates for partnerships?
- Which are candidates for administrative solutions?
- What are the relevant treatment options? What are the typical costs for a given treatment option?

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Next Steps

- Thought Leaders workshop to gather input from stakeholders.
- Draft Results: late summer 2019
- Final Report: spring 2020

Thank You

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