LOS ANGELES COUNTY

SMALL WATER SYSTEM RISK ASSESSMENT

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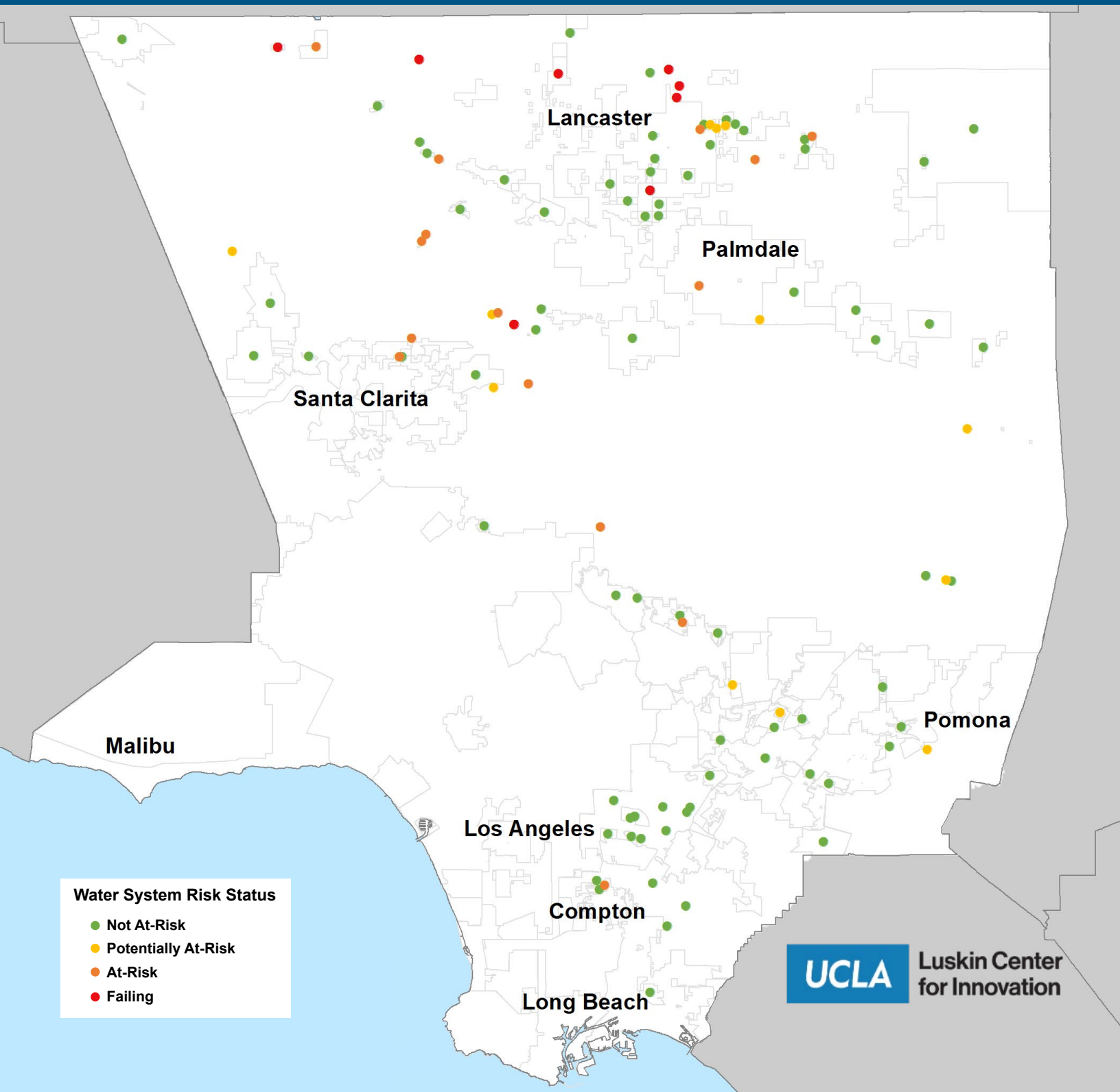

HIGHLIGHTS

- We use the publicly available data and methodology from a State Water Board effort to conduct a Risk Assessment of the 118 small water systems in Los Angeles County.
- 8 systems (7%) were found to be failing and 19 (16%) systems were found to be at-risk of failing.
- Both failing and at-risk systems are concentrated in the Antelope Valley region of the county.
- Water quality indicators contributed the most risk points to systems' total risk scores, followed by accessibility indicators.
- With the exception of service shutoff rates, water systems in Los Angeles County had lower average risk scores for each indicator compared to the statewide average.
- This brief serves as a template for regional analyses which could be conducted for any county in the state using State Board data, and can inform the Water Replenishment District's Needs Assessment in South Los Angeles County.

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AUTHORSHIP

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ACKNOWLEDGMENTS

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DISCLAIMER

The views expressed herein are those of the authors and not necessarily those of the University of California, Los Angeles as a whole. The authors alone are responsible for the content of this report.

1. INTRODUCTION

In April 2021, the UCLA Luskin Center for Innovation (LCI) collaborated with the California State Water Resources Control Board (State Board) to release the first comprehensive statewide assessment of small publicly regulated water systems for the state or conducted elsewhere across the U.S., known as the 2021 Drinking Water Needs Assessment.[1] The three core components of this analysis were assessments of water systems' risk of failure, the cost of solutions to address system failure, and drinking water affordability.

The Risk Assessment component of this analysis used 19 water quality, accessibility, affordability, and technical, managerial, and financial (TMF) capacity indicators to assess 2,779 small water systems across California. Based on these indicators, water systems were classified as either failing, at-risk, potentially at-risk, or not at-risk.

In this brief, we use the publicly available data from this effort to conduct a Risk Assessment of the 118 small water systems in Los Angeles County. We exactly copy the methodology employed in the State Board risk analysis. We then compare the results of our Los Angeles County focus to the statewide results. Additionally, we compare the L.A. County Risk Assessment results to the results from our 2020 analysis of the county's water systems, and provide maps of water system risk scoring by County Supervisorial District in the Appendix.[2]

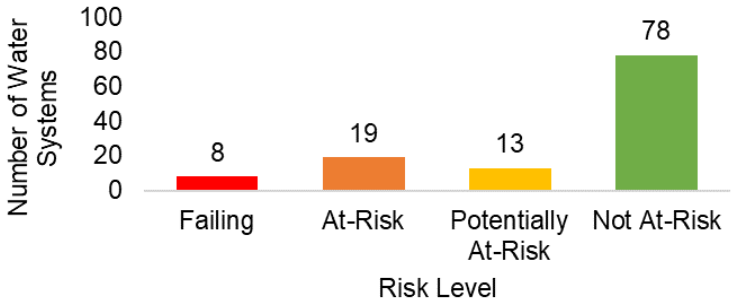
This brief serves as a template for regional analyses which could be conducted for any county in the state using State Board data, which will be updated on at least an annual basis and will be maintained for public access. Moreover, this analysis can inform the Water Replenishment District's own Needs Assessment of community water systems, which it is obligated to undertake with funding recently provided to it by the state legislature, within its supply territory in South L.A. County.

2. AT-RISK WATER SYSTEMS IN LOS ANGELES COUNTY

Only small water systems — those with fewer than 3,300 connections — in Los Angeles County were assessed. The majority of systems assessed serve residential areas (70%), followed by mobile home parks (17.7%), and schools (4%). As Figure 1 shows, excluding 8 failing systems, 19 water systems in L.A. County are classified as at-risk. Another 13 are classified as potentially at-risk, and 78 are not at-risk.

FIGURE 1

NUMBER OF WATER SYSTEMS AT EACH RISK LEVEL



[1] See full details of this effort here: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/needs.html

[2] Pierce, Gregory and Gmoser-Daskalakis, Kyra (2020). Community Water Systems in Los Angeles County: A Performance Policy Guide. UCLA Luskin Center for Innovation.

TABLE 1

POPULATION SERVED BY WATER SYSTEM AT EACH RISK LEVEL

Risk Level	Population
Failing	3,071
At-Risk	15,635
Potentially At-Risk	42,561
Not At-Risk	315,094

TABLE 2

NUMBER OF WATER SYSTEMS AT EACH RISK LEVEL

	Los Angeles County				Statewide
	All Water Systems	Non-Failing Systems	Failing Systems	Share of Non-Failing Systems	Share of Non-Failing Systems
At-Risk	26	19	7	17%	25%
Potentially At-Risk	13	13	0	12%	23%
Not At-Risk	79	78	1	71%	52%

FIGURE 2

DISTRIBUTION OF TOTAL RISK SCORES

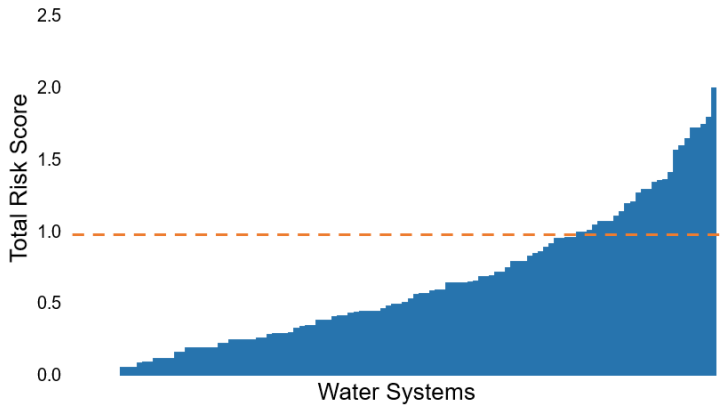


Table 1 summarizes the population served by water systems at each risk level. Much of the population is served by not at-risk water systems. 3,071 people in Los Angeles County are served by a failing water system. Over fifteen thousand people are served by a water system that is at risk of failing.

As a share of the total of non-failing systems, Los Angeles County had fewer at-risk water systems than the state average. Over two-thirds of small water systems in Los Angeles County were classified as not at-risk, compared to 50% at the state-level. Table 2 compares the share of non-failing systems in Los Angeles County to the state.

Figure 2 shows the distribution of total risk scores for all Los Angeles County water systems. Each bar represents the score for one water system. Water systems with a combined total risk score over 1 (shown by the dashed orange line) are considered at-risk.

Figure 3 illustrates where these water systems are across Los Angeles County.

Figure 4 compares the share of water systems across risk classifications assessed in each county.[3] Counties with the lowest combined share of failing and at-risk water systems are on the left, while the counties with the highest combined share are on the right.

Los Angeles County can be found to the left of the center of the figure. Kings County had the highest share of at-risk (69%) and failing (6%) systems, while San Francisco and Modoc County had zero at-risk or failing systems. Of all systems assessed in the Los Angeles County, 16% were at-risk and 7% were failing.

FIGURE 3

MAP OF PUBLIC WATER SYSTEMS IN LOS ANGELES EVALUATED FOR THE RISK ASSESSMENT

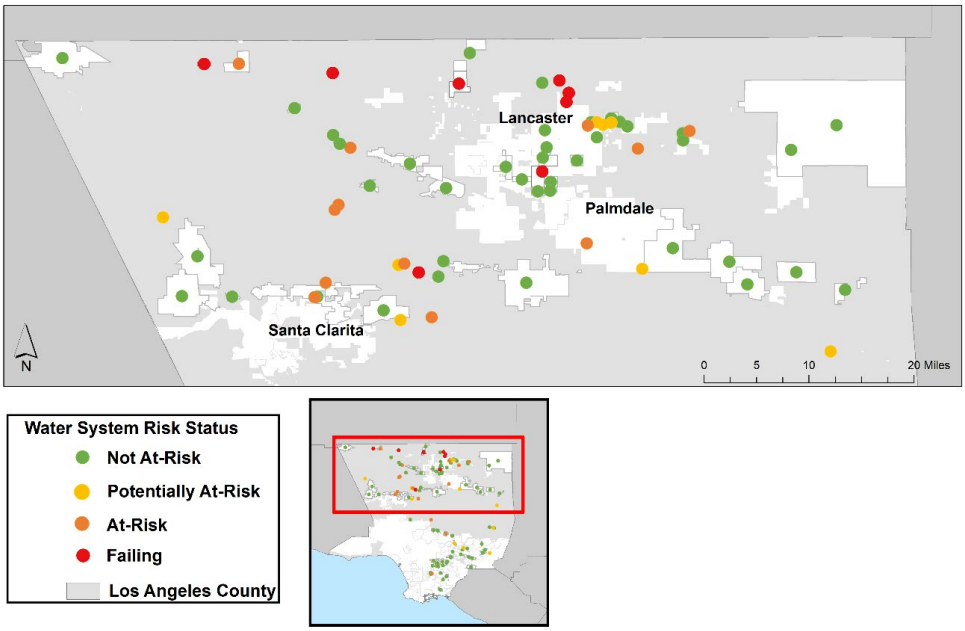
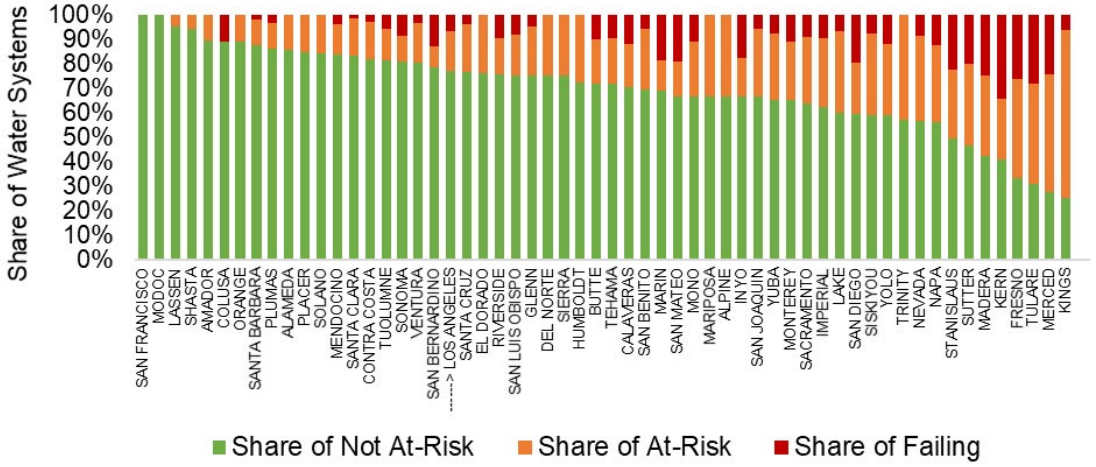


FIGURE 4

COMPARISON OF THE SHARE OF FAILING AND AT-RISK SYSTEMS IN EACH COUNTY



[3] In this figure, for simplicity of display, the not at-risk category includes systems scored as at potentially at-risk in the State Board methodology.

3. KEY INDICATORS FOR AT-RISK SYSTEMS

As described above, water systems were assessed along 19 indicators grouped into four categories: water quality, accessibility, affordability, and technical, managerial, and financial (TMF) capacity. The underlying data for each of these indicators was recoded into 0-1 depending on whether the water system exceeded the established at-risk threshold, with scores closer to 1 being more at-risk. For some indicators, a weight was applied to this 0-1 score. The scored and weighted indicators were combined to make a total risk score. Full details of this methodology are provided in the State Board's 2021 Drinking Water Needs Assessment Report.

Table 3 shows the average score for each indicator for all water systems in Los Angeles County ranked in descending order. The statewide average for each indicator is included for comparison. 'Number of Water Sources', 'Maximum Duration of High Potential Exposures (HPE)', and 'Number of Service Connections' were the indicators with the three highest average scores in Los Angeles County. The top two indicators at the state-level were the same, but 'Percentage of Sources Exceeding a Maximum Contaminant Level (MCL)' was the third highest. With the exception of 'Percent Shutoffs', water systems in Los Angeles County had lower average scores for each indicator compared to the statewide average score.

TABLE 3

RISK INDICATORS RANKED BY THEIR AVERAGE WEIGHTED SCORE AMONG AT-RISK WATER SYSTEMS

Category	Indicator	L.A. County	Statewide
Accessibility	Number of Water Sources	1.02	2.24
Water Quality	Maximum Duration of High Potential Exposure (HPE)	0.68	1.35
TMF Capacity	Number of Service Connections	0.63	0.94
Accessibility	Presence of Interties	0.60	0.97
Water Quality	Increasing Presence of Water Quality Trends Toward MCL	0.60	0.68
Water Quality	Percentage of Sources Exceeding an MCL	0.54	1.13
Accessibility	Water Source Types	0.31	0.73
Affordability	Percent of Median Household Income (%MHI)	0.30	0.92
Accessibility	DWR – Drought & Water Shortage Risk Assessment Results	0.30	0.59
TMF Capacity	Monitoring and Reporting Violations	0.19	0.23
Water Quality	History of E. coli Presence	0.13	0.19
Affordability	Percent Shutoffs	0.11	0.06
TMF Capacity	Extensive Treatment Installed	0.10	0.40
Accessibility	Critically Overdrafted Groundwater Basin	0.07	0.85
Water Quality	Past Presence on the failing List	0.07	0.20
Affordability	Extreme Water Bill	0.02	0.10
Water Quality	Treatment Technique Violations	0.01	0.04
TMF Capacity	Significant Deficiencies	0.00	0.07
TMF Capacity	Operator Certification Violations	0.00	0.04

FIGURE 5

SHARE OF EACH RISK INDICATOR CATEGORY IN CALCULATING THE TOTAL RISK SCORE FOR AT-RISK WATER SYSTEMS

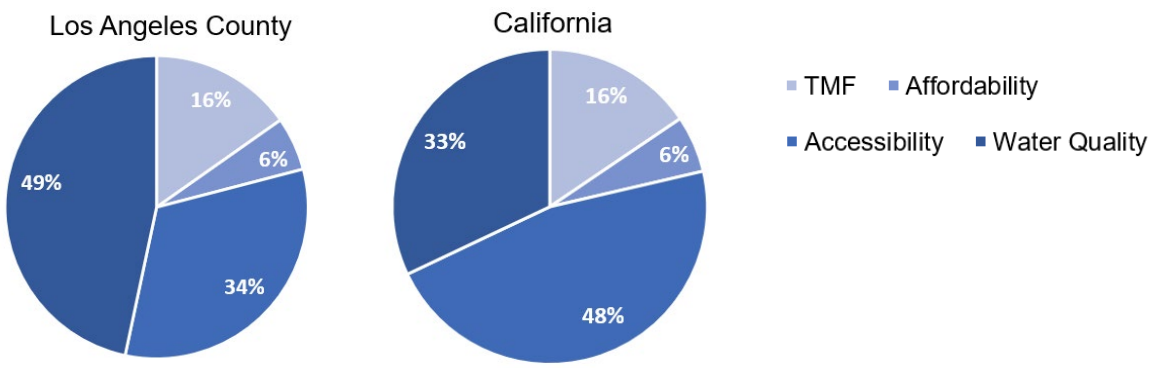
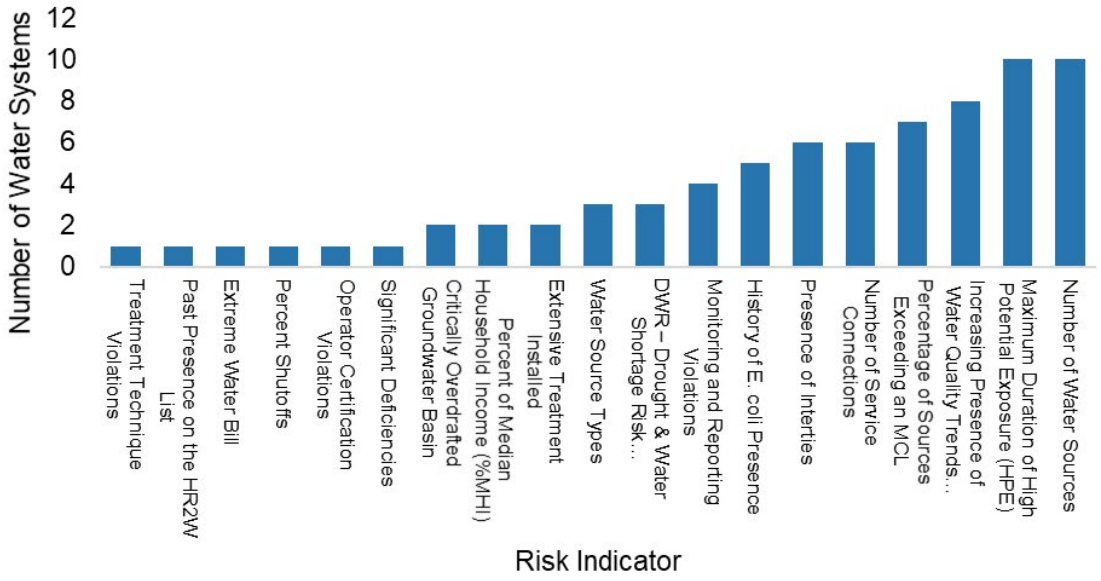


FIGURE 6

RISK INDICATORS RANKED BY THEIR EFFECT ON THE TOTAL NUMBER OF AT-RISK SYSTEMS



Figures 5 compares the share of each indicator category's contribution to the total risk score for at-risk water systems in Los Angeles County and the whole state. In Los Angeles County, water quality indicators contributed the most weighted risk points to the total risk score, followed by accessibility indicators. At the state level, accessibility indicators compose most of the total risk score, followed by water quality. TMF capacity and affordability category indicator scores made up 16% and 6% of the total risk score in both Los Angeles County and the state.

Figure 6 shows how many additional water systems are considered at-risk by including each indicator, holding all other indicators constant. 'Number of Water Sources', 'Maximum Duration of High Potential Exposure', and 'Increasing Presence of Water Quality Trends Toward MCL' are the three indicators that had the greatest effect

on the number of at-risk systems in LA County. At the state level, 'Presence of Interties', 'Number of Service Connections', and 'Maximum Duration of High Potential Exposure' were the top three indicators that had an effect on the total number of at-risk water systems. 'Number of Water Sources' was the fifth highest indicator at the state-level, and 'Increasing Presence of Water Quality Trends Toward MCL' was sixth.

Each at-risk water system scored above the 'at-risk' threshold for at least four indicators in order to be classified as an at-risk water system. The average number of indicators an at-risk water system scored above the threshold was seven, slightly higher than the state average of six. Figure 7 illustrates the distribution of the number of indicators each water system scored above the threshold for at-risk and not at-risk water systems.

Figures 8 through 11 show the number of water systems that scored above the threshold (and above the tiered threshold when relevant) for each indicator, organized by indicator category (water quality, accessibility, affordability, and TMF capacity). Note that ten systems were excluded from the affordability analysis but were included in all other indicator categories.

FIGURE 7

DISTRIBUTION OF THE NUMBER OF RISK INDICATOR THRESHOLDS EXCEEDED BY AT-RISK AND NOT AT-RISK WATER SYSTEMS

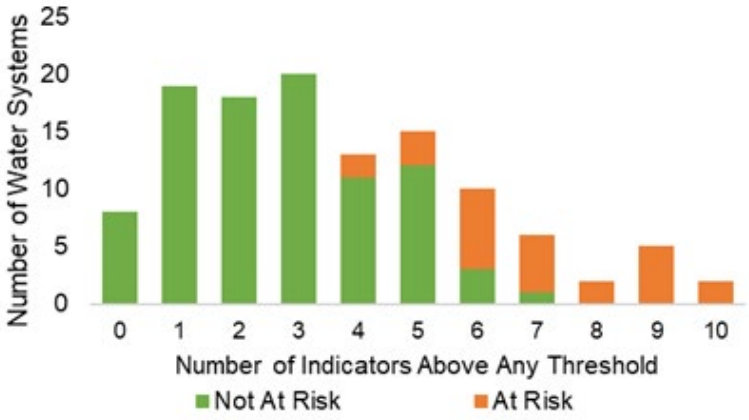


FIGURE 8

SYSTEMS EXCEEDING THRESHOLDS FOR EACH WATER QUALITY RISK INDICATOR

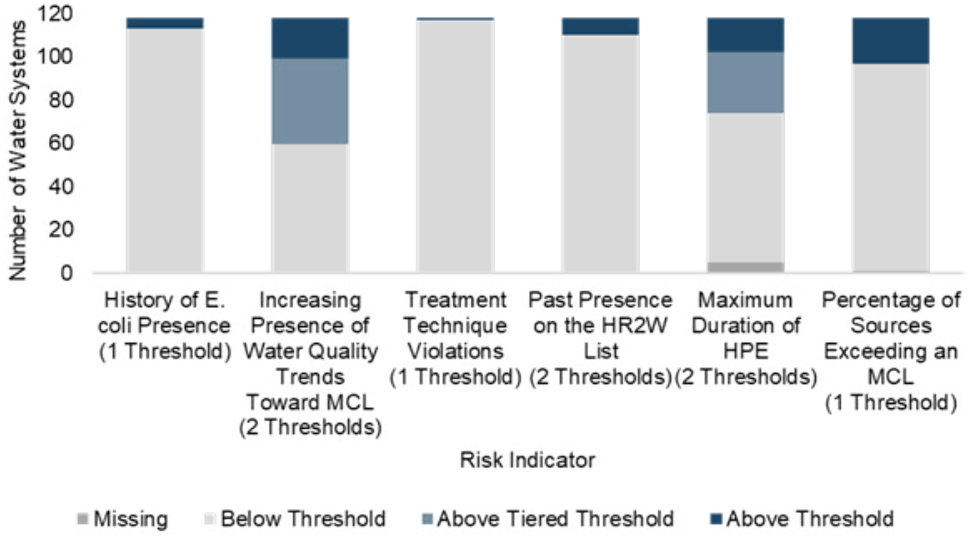


FIGURE 9

SYSTEMS EXCEEDING THRESHOLDS FOR EACH ACCESSIBILITY RISK INDICATOR

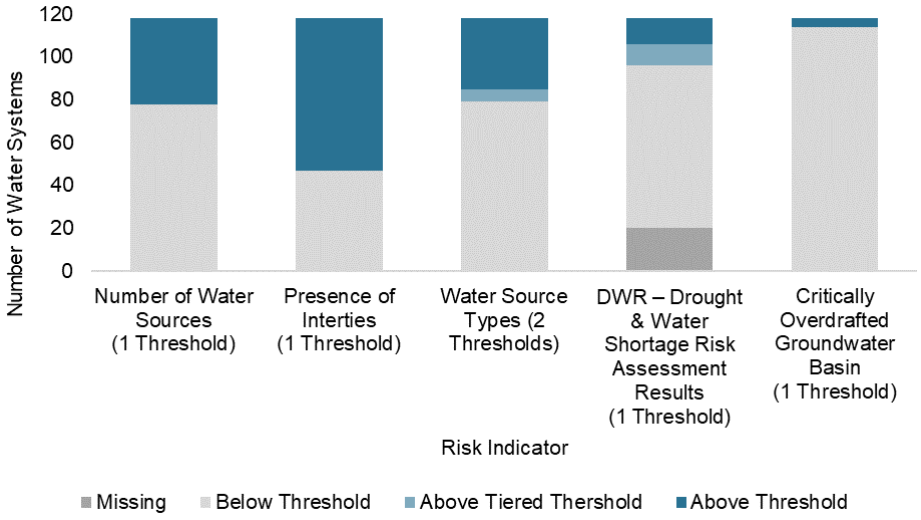


FIGURE 10

SYSTEMS EXCEEDING THRESHOLDS FOR EACH AFFORDABILITY RISK INDICATOR

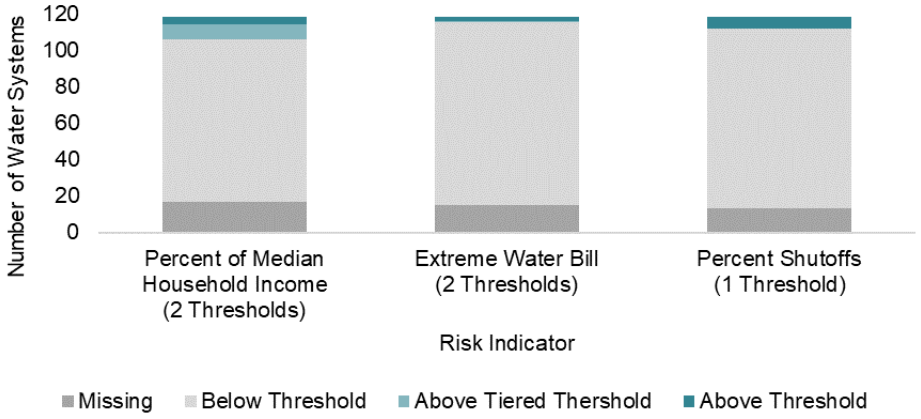
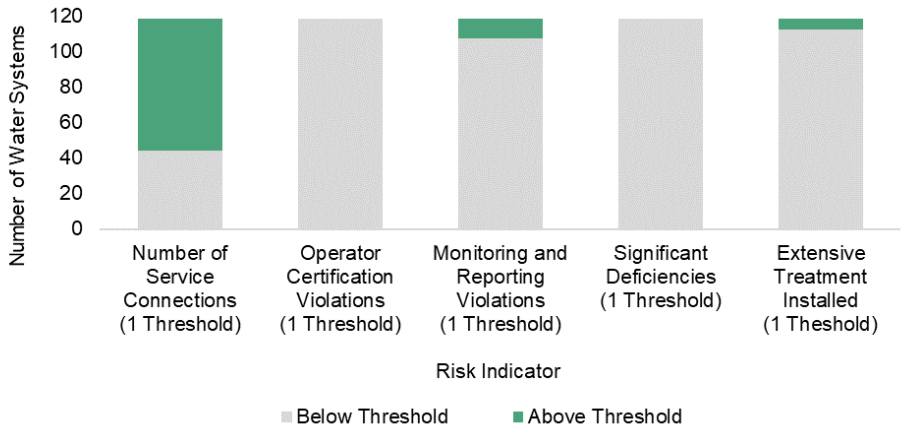


FIGURE 11

SYSTEMS EXCEEDING THRESHOLDS FOR EACH TMF CAPACITY RISK INDICATOR



4. COMPARISON TO THE LCI 2020 COMMUNITY WATER SYSTEMS PERFORMANCE GUIDE

Our 2020 Community Water Systems in Los Angeles County: A Performance Policy Guide analyzed the performance of all 200 community water systems in the county.[4] Among systems with sufficient data, we classified 200 community water systems (CWS) in Los Angeles County into six tiers:

(1) Failing/Major Concern,
(2) Severe Concern,
(3) Moderate Concern,
(4) Limited Concern,
(5) Minimal Concern,
(6) No apparent cause for concern.

Systems classified using indicators across four categories: quality, affordability, accessibility/reliability, and TMF. Some, but not all, indicators used in the analysis were the same as those included in the risk assessment.

In this section, we compare the results for the 2020 CWS Performance Guide to the Risk Assessment. Figure 12 and Table 4 summarize how water system classifications compared between the two analyses. As these analyses use different methods, not all systems are classified in the same way. However, as seen in the figure, many failing and At-Risk systems were also classified as Failing/Major Concern in the 2020 CWS Performance Guide. Similarly, many systems classified as Not At-Risk were also classified as Minimal Concern or No Apparent Cause for Concern.

FIGURE 12

COMPARISON OF RISK ASSESSMENT AND CWS PERFORMANCE GUIDE CLASSIFICATIONS

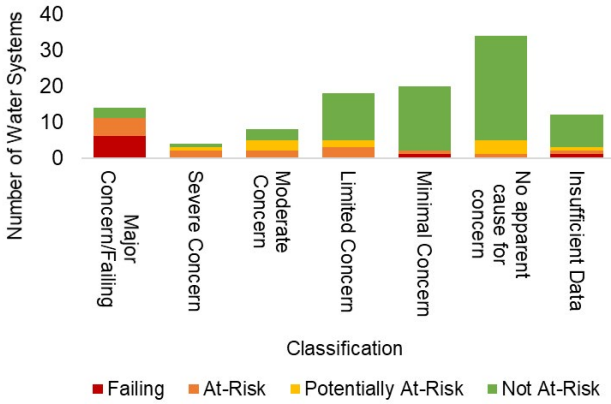


TABLE 4

COMPARISON OF RISK ASSESSMENT AND CWS PERFORMANCE GUIDE CLASSIFICATIONS

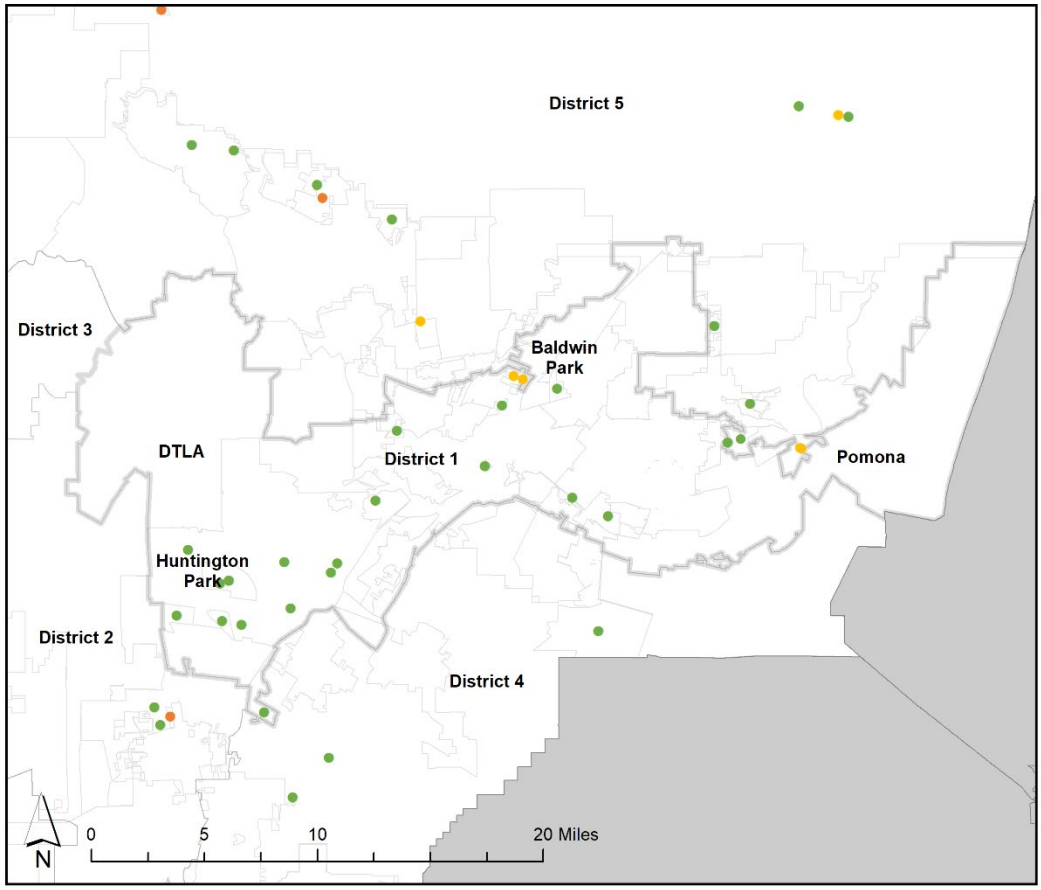
Category	Major Concern/ Failing	Severe Concern	Moderate Concern	Limited Concern	Minimal Concern	No Apparent Cause for Concern	Insufficient Data
At-Risk	5	2	2	3	1	1	1
Potentially At-Risk	0	1	3	2	0	4	1
Not At-Risk	3	1	3	13	18	29	9
Failing	6	0	0	0	1	0	1
Not Assessed	1	0	5	8	11	64	1

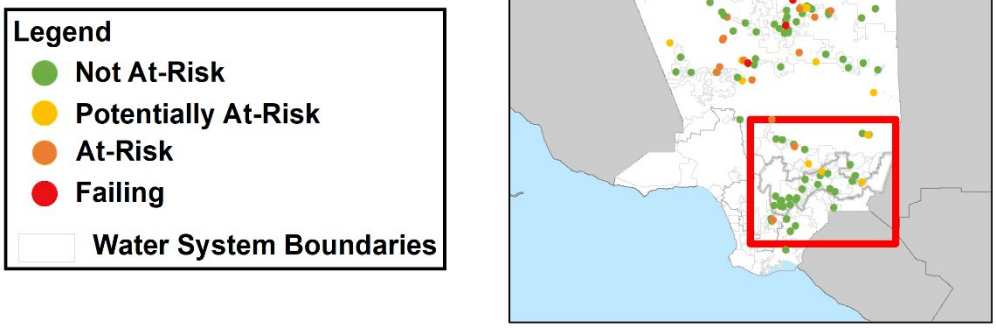
[4] Pierce, Gregory and Gmoser-Daskalakis, Kyra (2020). Community Water Systems in Los Angeles County: A Performance Policy Guide. UCLA Luskin Center for Innovation.

APPENDIX: WATER SYSTEM RISK SCORES BY SUPERVISORIAL DISTRICT

FIGURE A-1

WATER SYSTEM RISK SCORING IN LOS ANGELES COUNTY SUPERVISORIAL DISTRICT 1

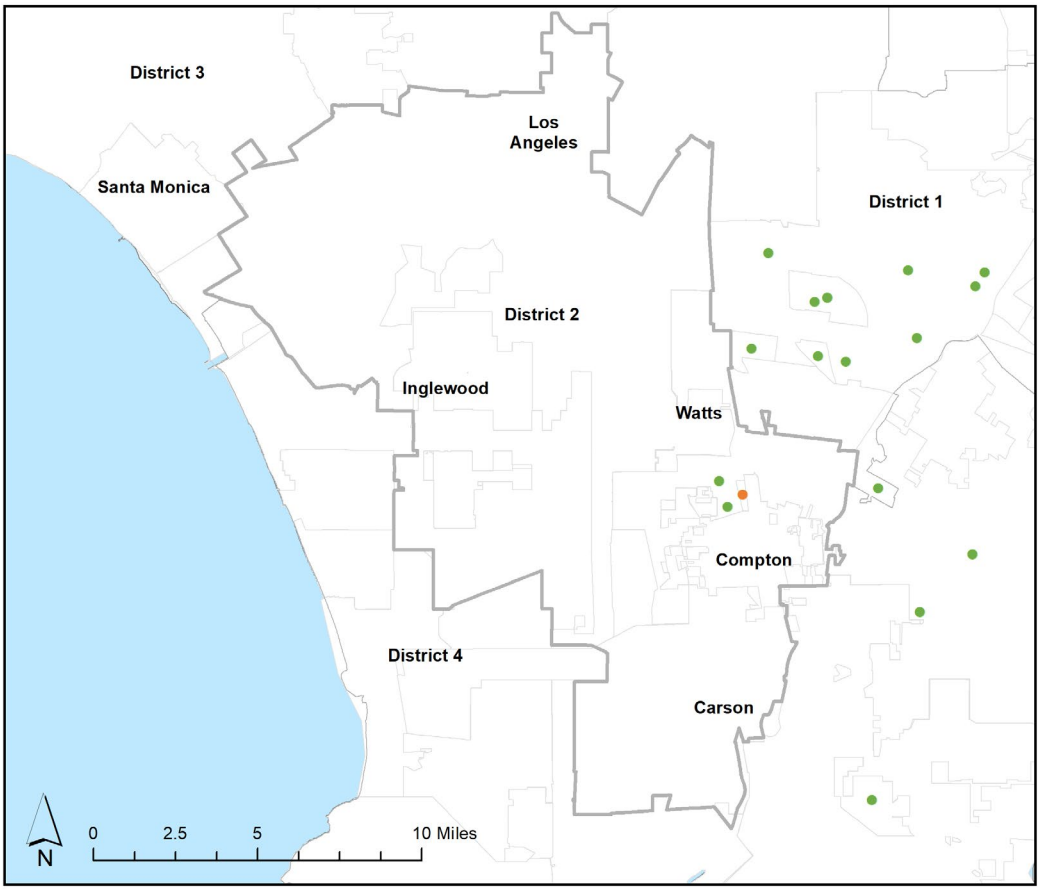


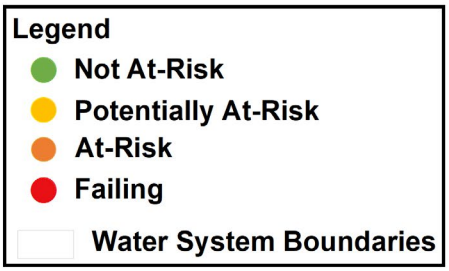


Legend
- Not At-Risk
- Potentially At-Risk
- At-Risk
- Failing
- Water System Boundaries

FIGURE A-2

WATER SYSTEM RISK SCORING IN LOS ANGELES COUNTY SUPERVISORIAL DISTRICT 2





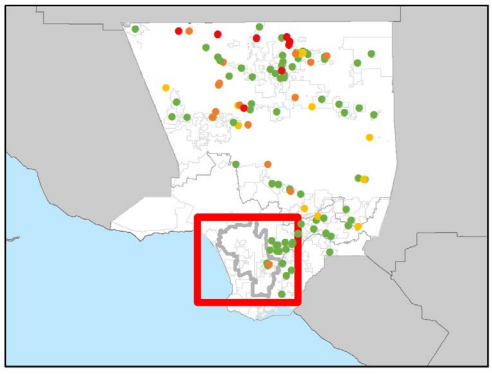
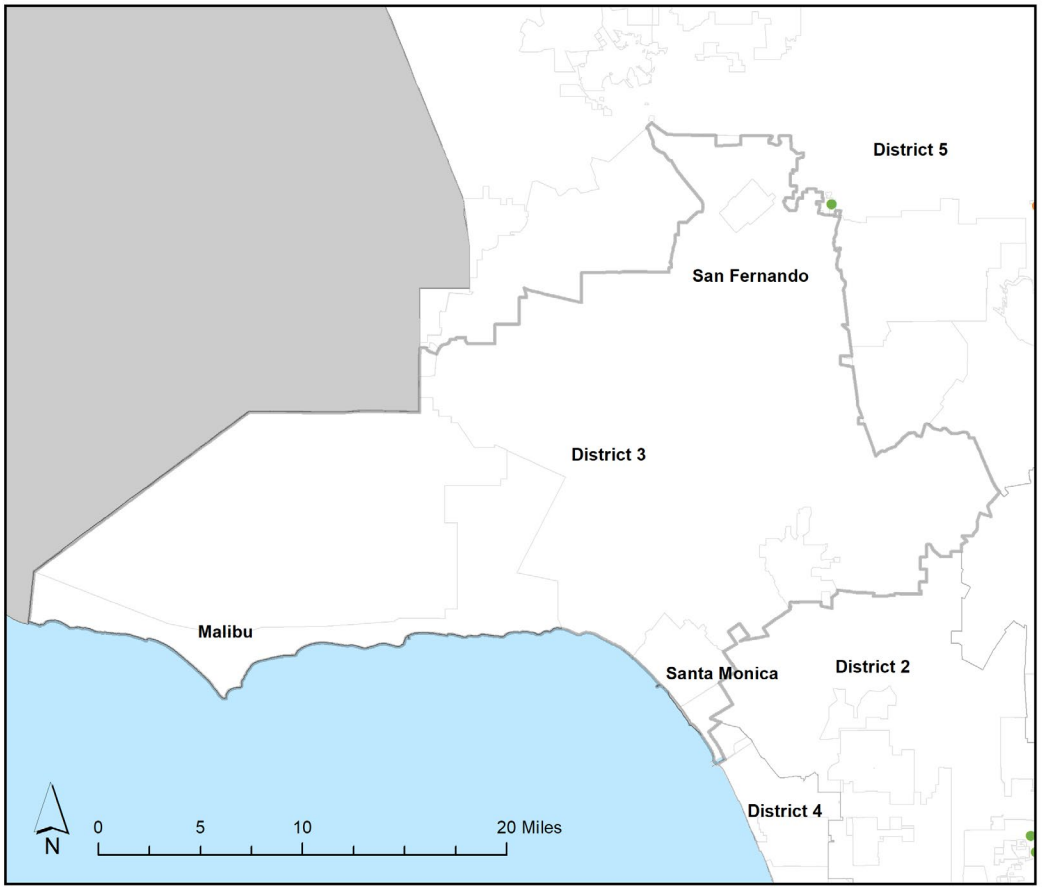


FIGURE A-3

WATER SYSTEM RISK SCORING IN LOS ANGELES COUNTY SUPERVISORIAL DISTRICT 3



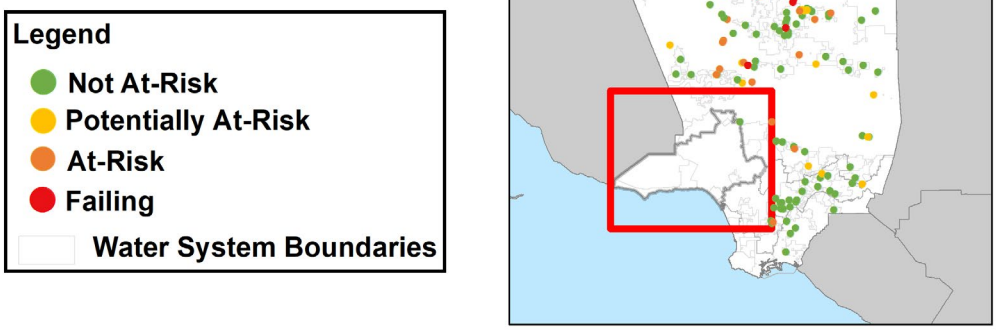
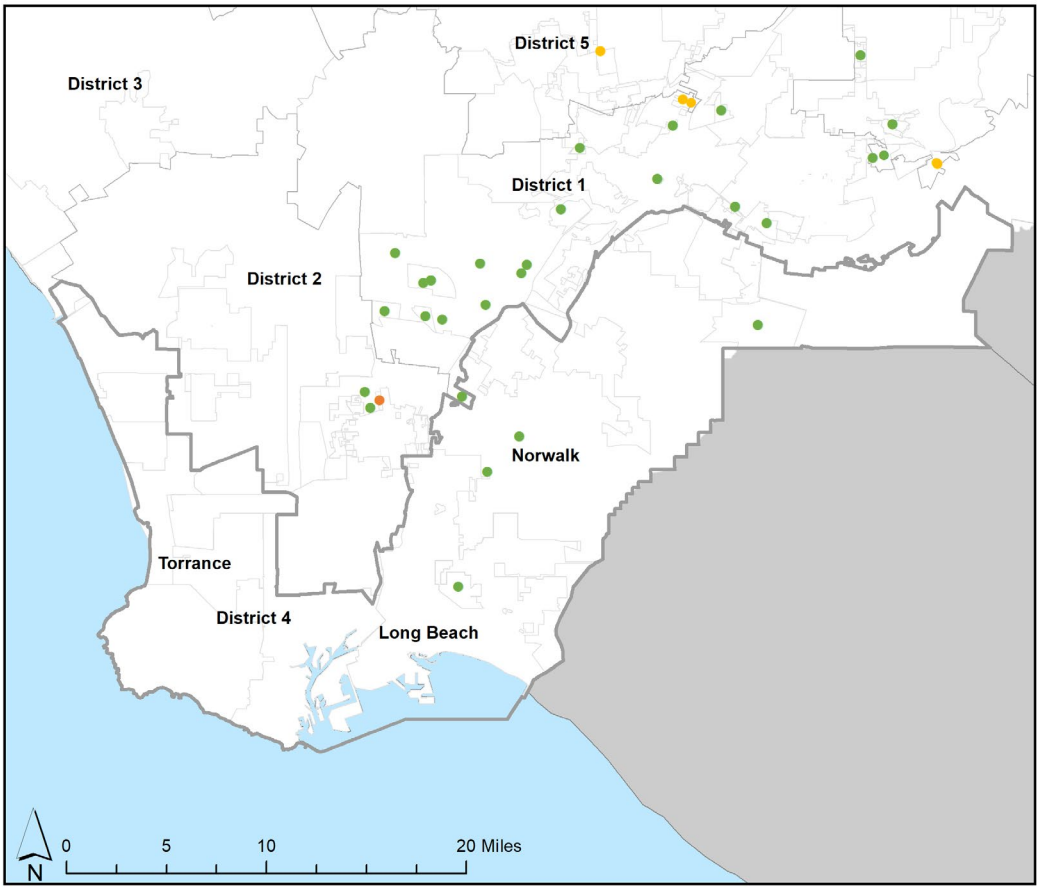
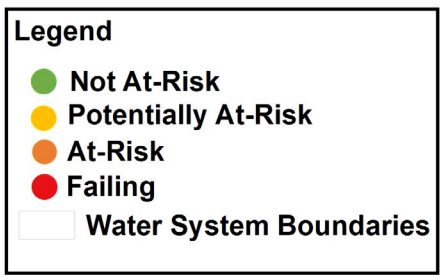


FIGURE A-4

WATER SYSTEM RISK SCORING IN LOS ANGELES COUNTY SUPERVISORIAL DISTRICT 4





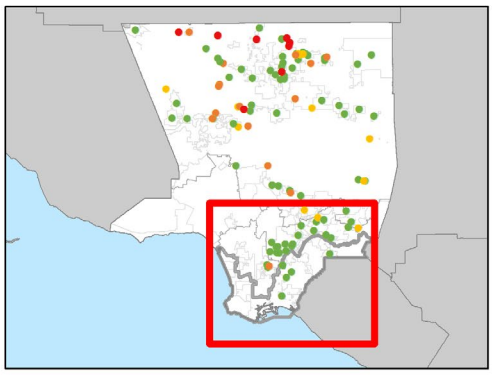
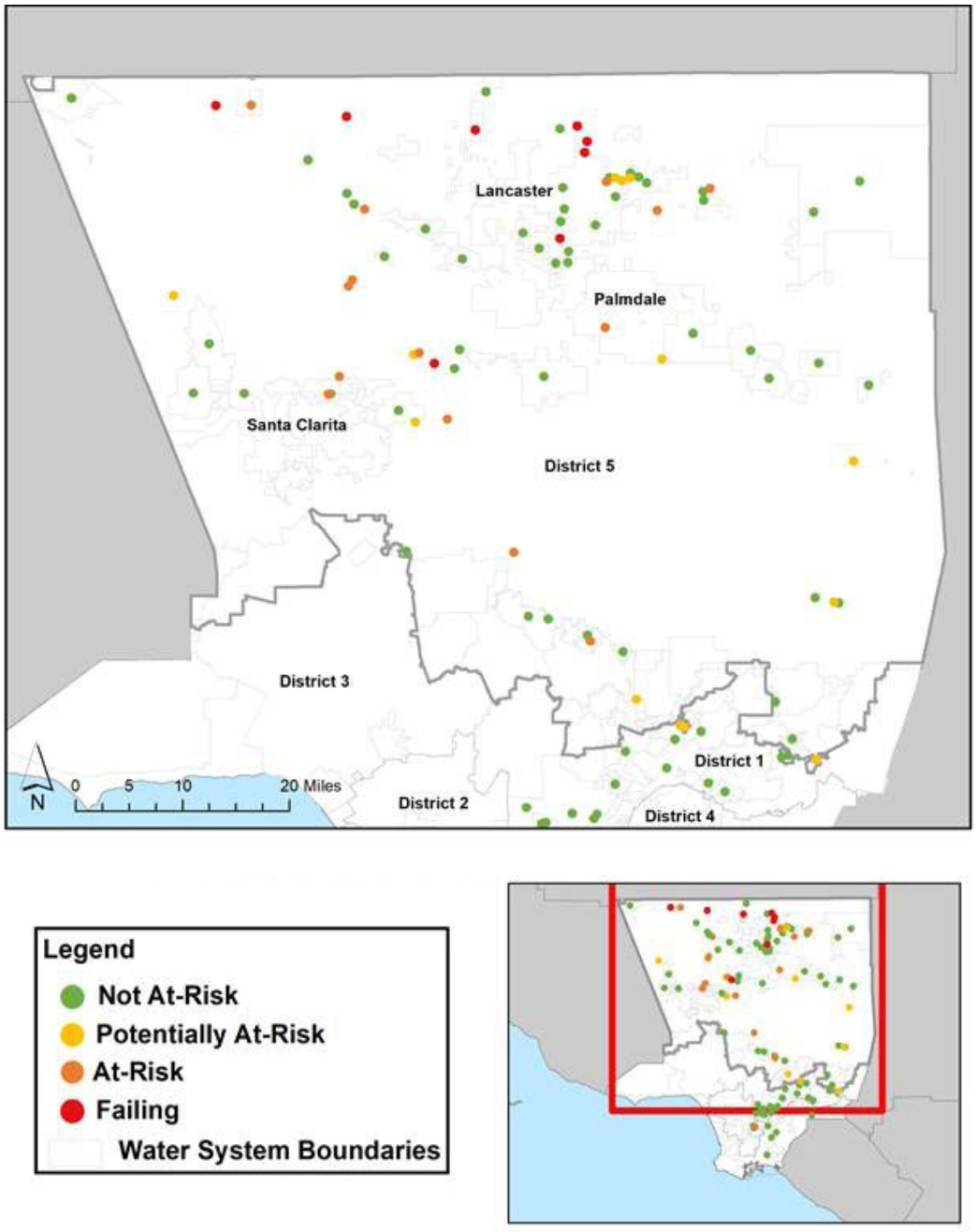


FIGURE A-5

WATER SYSTEM RISK SCORING IN LOS ANGELES COUNTY SUPERVISORIAL DISTRICT 5



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