SAFE CLEAN WATER PROGRAM

MEMORANDUM

Date:	Tuesday, April 22, 2025
Project:	Safe, Clean Water Program 2025 Adaptive Management
To:	Dusadee Corhiran and Mayra Cabrera, LA County Public Works
From:	Craftwater
Attachment:	A – Recommended Water Quality Scoring Criteria Revisions
Subject:	**Water Quality Scoring Adaptation Pilot Rubrics**

Executive Summary

The purpose of this memo is to **inform potential adaptation of scoring criteria and evaluation of Water Quality Benefits** after five rounds of Safe, Clean Water Program (Program) project submittals as part of adaptive management. To evaluate historical trends and alternative scoring criteria, the Study **analyzed 183 Infrastructure Program project applications**, including projects that were accepted and funded, considered but not funded, referred to the Technical Resources Program, or withdrawn. For Recommended Scoring Criteria Revisions, see Attachment A.

The following alternative Water Quality Benefit scoring approaches were evaluated:

1. **Adding Gradation to Current Scoring Rubrics**: Provides additional granularity so that projects can score at one-point increments, applied to current criteria.
2. **Providing an Alternative Cost-Effectiveness Rubric Based on 85th Percentile Storm Runoff Volume**: Creates an optional scoring rubric that would use an estimation of the runoff volume captured during an 85^{th} percentile design storm. Note that the analysis herein only used estimates of 85th percentile *runoff volumes* tributary to historical projects, which will need to be further verified using modeled *capture volumes* estimated by pending updates to the Projects Module. Proposed adaptations would account for project diversion and storage capabilities of a project, which allows the estimation of the volume actually captured during an 85th percentile storm event.
3. **Calibrating Score Ranges to Historical Projects**: Evenly scales the scoring criteria across the range of proposed project performance from the first five rounds of Program implementation.
4. **Adding Gradation to Historically Calibrated Scoring Rubrics**: Provides additional granularity so that projects can score at one-point increments; applied to historically calibrated criteria.
5. **Creating Pollutant Mass Capture-based Scoring Rubrics**: Mass of Zinc captured by a project was used to develop scoring metrics that were awarded at one-point increments.

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Public Works should consider adding gradation to the existing scoring rubric (alternate 1 above). This approach provides added granularity to assigned scores, which adds specificity to the assessment of Program-worthy multi-benefit project efficiencies and performance, and has the potential to result in widespread increased project scoring, and **could elevate a small number of projects not earning the final score threshold of 60 points to a final score equal to satisfy the threshold**. **Public Works should also consider providing project developers with an option to use the 85th percentile runoff capture volume rather than 24-hour capacity in calculating cost-effectiveness scores in one-point increments for wet weather projects (alternate 2 above).** This metric is more correlated with pollution capture magnitudes and assigns scores more in line with the goal of pollutant reduction.

Calibrating Scoring to Historical Projects (alternate 3 above) is not recommended, as this process reduces the scores that many projects could earn, due to the distribution of historic projects relative to scoring criteria. **Adding gradation to historically calibrated scoring rubrics (alternate 4 above) is also not recommended**, as it could decrease scoring outcomes for many projects, for the same reasons as historical calibration without gradation. Use of **the Pollutant Mass Capture-based scoring rubric (alternate 5 above) is not recommended**, unless final point thresholds are decreased or the total number of points awarded for Water Quality Benefits are increased.

While the projects included in this analysis represented a robust dataset, the team acknowledges that they were not comprehensive of potential projects that were considered but *not* submitted to the Program. Furthermore, the analysis relied only on the project performance data proposed to the Program and available via module outputs provided, which may have changed since initial submittal.

Introduction and Purpose

The objective of this memo is to inform potential Public Works guidance on Water Quality Benefit scoring criteria adaptations. To accomplish this objective, the memo presents (1) a brief review of Water Quality Benefit scoring trends under the current criteria, (2) explores the programmatic implications of adding gradation to scoring rubrics, (3) examines the programmatic implications of using 85th percentile storm runoff volumes rather than 24-hour storage volumes in the calculation of cost-effectiveness scores, (4) explores the programmatic implications of calibrating the criteria (using both the current stepwise-style point increments and single-point increments using historical project data and (5) assesses the creation of new Water Quality Benefits scoring rubrics based on magnitude of pollutant reduction. These various scoring alternative approaches were selected to explore a range of opportunities for adjustments to the existing criteria and their respective programmatic implications.

Review of Current Water Quality Scoring Criteria

The Feasibility Study Guidelines for the Program include the current Infrastructure Program Project Scoring Criteria. The Water Quality Benefit scoring criteria have two parts: for wet weather projects, water quality cost-effectiveness (24-hour BMP capacity[1] per capital cost in millions of dollars or AF/$M), and for the weather projects, dry weather flow capture. The Water Quality Benefit score for wet weather projects is based on the percentage of primary and secondary pollutant capture (%) and for dry weather projects is based on the tributary size of the project's drainage area. The current rubric for cost-effectiveness is shown in Table 1 and Figure 1, and the rubric for water quality benefit is shown in Table 2, Figure 2, and Figure 3.

Table 1. Current Water Quality Cost Effectiveness / Dry Weather Capture Scoring Criteria

For Wet Weather BMPs only: Water Quality Cost Effectiveness (CE): (CE) = (24-Hours BMP Capacity) [1] / (Capital Cost in $Millions) ($/AF)	Points
< 0.4	0
0.41-0.6	7
0.6-0.8	11
0.8-1.0	14
> 1.0	20
For Dry-weather BMPs Only: Projects must be designed to capture, infiltrate, treat and release or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows	20

Table 2. Current Water Quality Benefit Scoring Criteria

For Wet Weather BMPs only: Water Quality Benefit: Percent of influent pollutants treated by BMP on an average annual basis over a 10-year period using WMMS model (30 points max)	Primary Pollutant Points	Secondary Pollutant Points
>50%	15	5
>80%	20	10
For Dry-weather BMPs Only: For Dry-weather BMPs Only: Tributary size of Dry Weather BMP (acres) (20 points max)	**Points**	
<200	10	
>200	20	

[1] Management of the 24-hour event is considered the maximum capacity of a Project for a 24-hour period. For water quality focused Projects, this would typically be the 85th percentile storm capacity. Units are in acre-feet (AF).

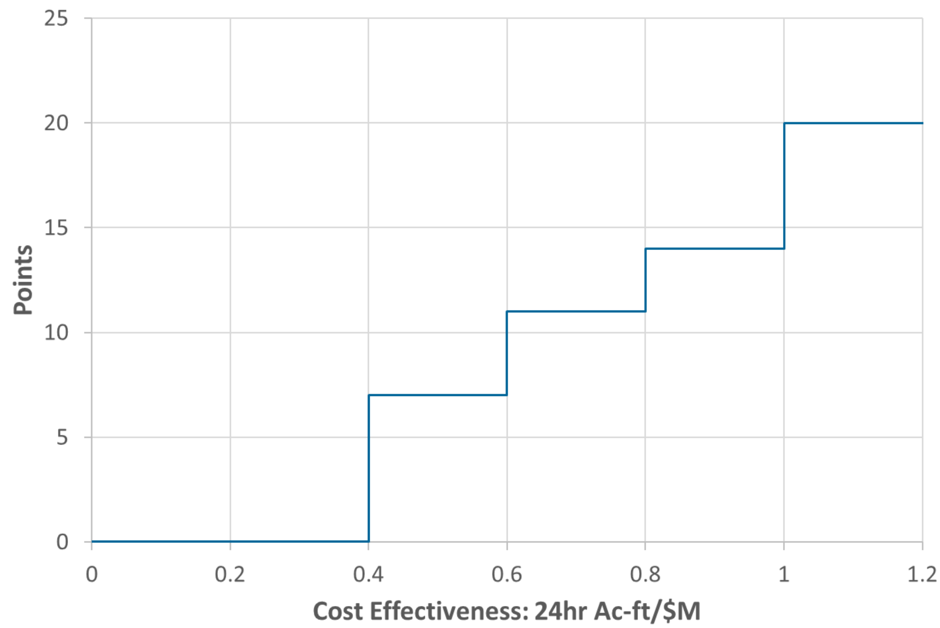

Figure 1. Current Cost Effectiveness Scoring Rubric

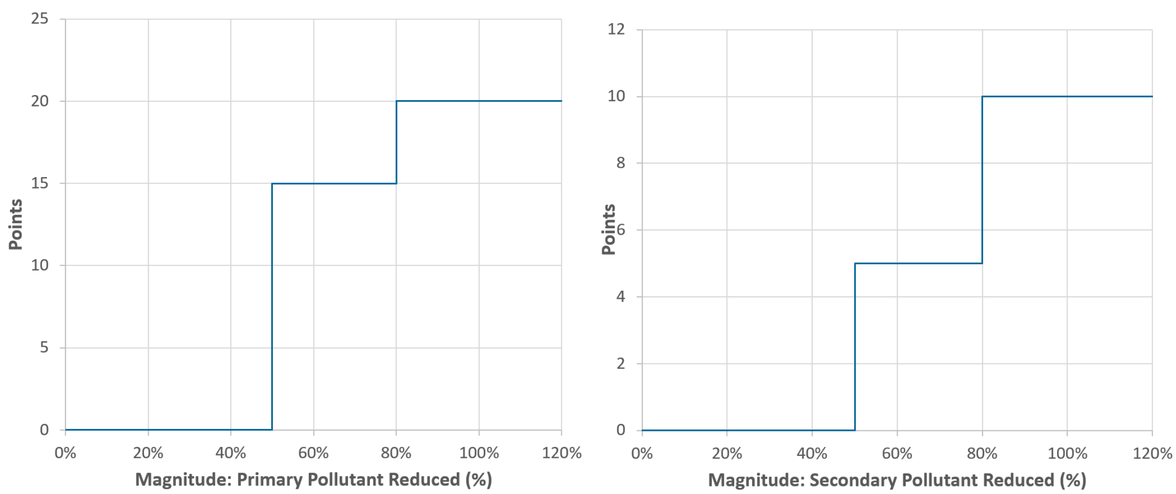

Figure 2. Current Water Quality Benefit Scoring Rubric for Wet Weather Projects

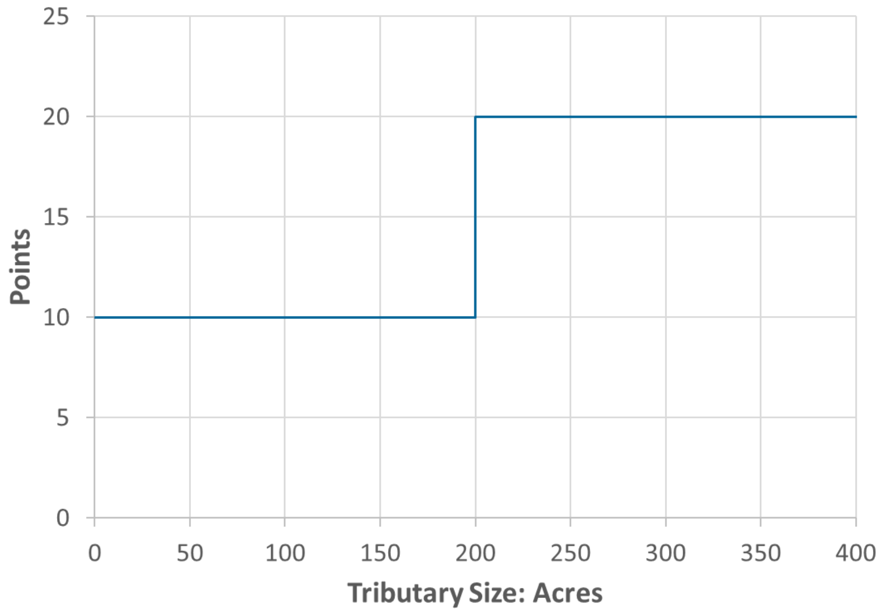

Figure 3. Current Water Quality Benefit Scoring Rubric for Dry Weather Projects

Data Assumptions and Limitations

Data from the first five rounds of Infrastructure Program applications was exported from the Program module to evaluate historical Water Quality Benefit scoring trends. Several key assumptions were made:

- **Projects with incomplete data were screened out.** Some project module data provided was incomplete and represents entries that may not yet have been submitted for scoring. This analysis excluded those and ultimately included 183 projects from the following categories: Accepted Funded (134), Considered Not Funded (41), Refer to Technical Resource Program (4), Withdrawn (4).
- **Duplicate Projects were screened out.** If multiple submissions exist in the module for the same phase of the same project, all but the most recent submission were screened out.
- **Scores were analyzed assuming reported scores for Dry weather projects for dry weather flow capture**. This analysis did not consider adjusted metrics for dry weather capture. A total of 144 wet weather projects and 39 dry weather projects were included in the analysis.
- **Null values or “N/A” values were excluded from the analysis**. The module data included null 24-hour capacity and/or null pollutant capture for some projects. Scores for those criteria were not computed for projects with missing data.

Historical Water Quality Benefit Scoring Trends

The histograms shown below in Figure 4, Figure 5, and Figure 6 show that 94 percent of submitted wet weather projects earned cost-effectiveness points, 99 percent of wet weather earned water quality benefit points, and 100% of dry weather projects earned water quality benefit points. Figure 7 through Figure 10 below display the distribution of historical project water quality cost-effectiveness and water quality benefit scores compared to the Water Quality Benefits scoring criteria. These data suggest that typical projects submitted to the Program easily earn cost-effectiveness and water quality benefit points. In fact, 31% of projects included in this analysis received the maximum points possible for Water Quality Benefits. This means that any proposed change to a scoring rubric that does not result in a similar distribution of project scores would result in a decrease in scores for a number of projects. Figure 11 shows the average Water Quality Benefits scores earned by Watershed Area, which shows that cost-effectiveness points and water quality benefit points are both earned across all Watershed Areas. The current scoring metrics produce a distribution of scores earned by historically submitted projects that tends toward high point values.

Figure 4. Histogram of Historical Cost-Effectiveness Scores Under Current Rubric

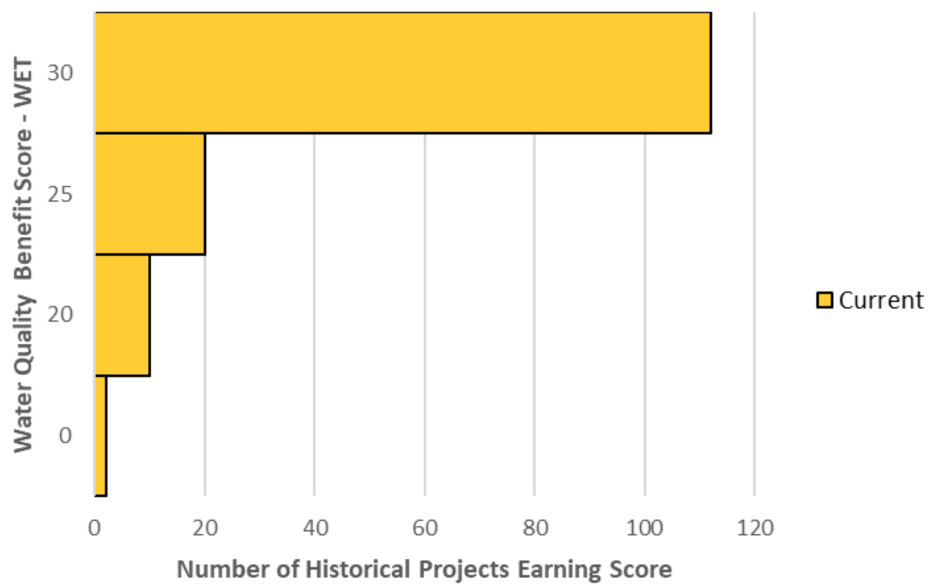

Figure 5. Histogram of Historical Quality Benefit Scores for Wet Weather Projects Under Current Rubric

Figure 6. Histogram of Historical Quality Benefit Scores for Dry Weather Projects Under Current Rubric

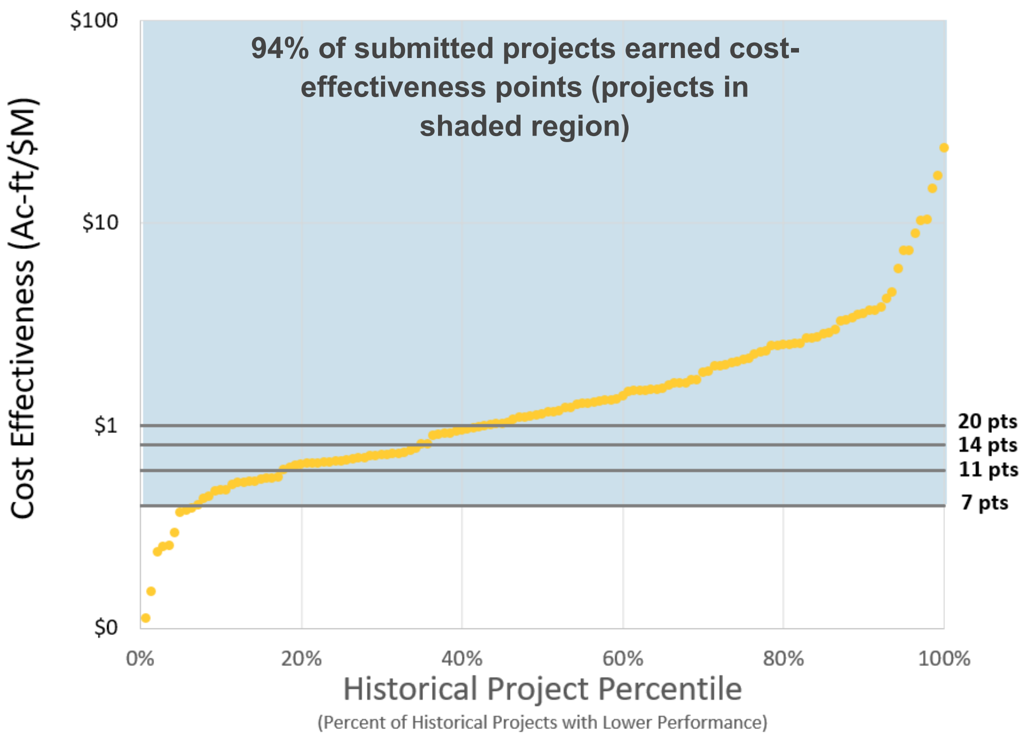

Figure 7. Distribution of Historical Project Cost-Effectiveness Compared to Scoring Criteria (note logarithmic scale)

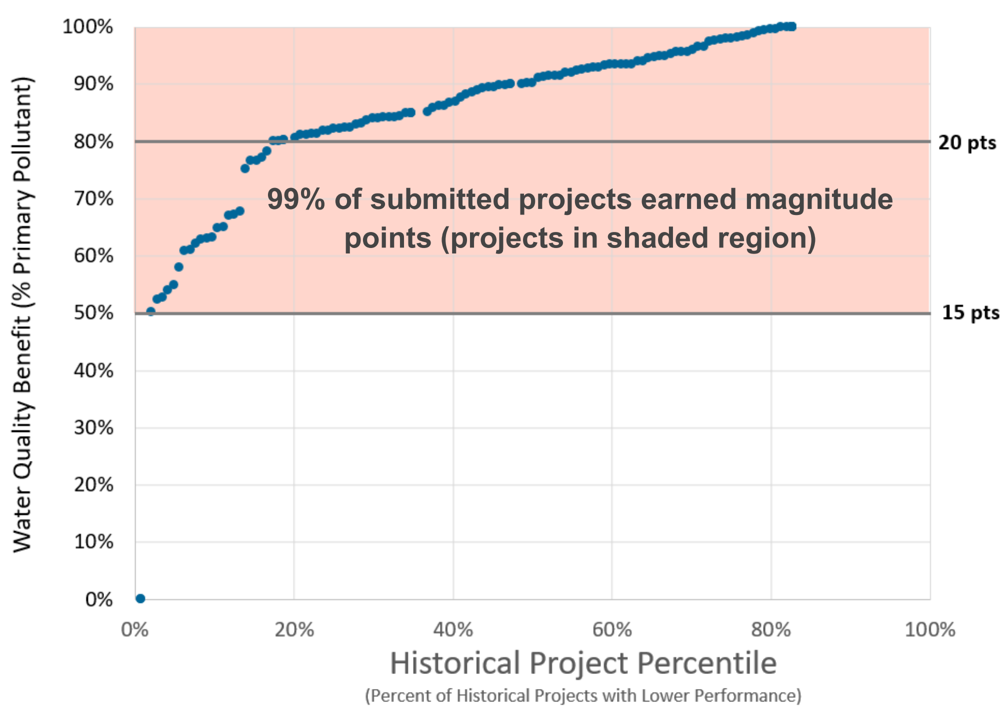

Figure 8. Distribution of Historical Wet Weather Project Water Quality Benefits for Primary Pollutants Compared to Scoring Criteria

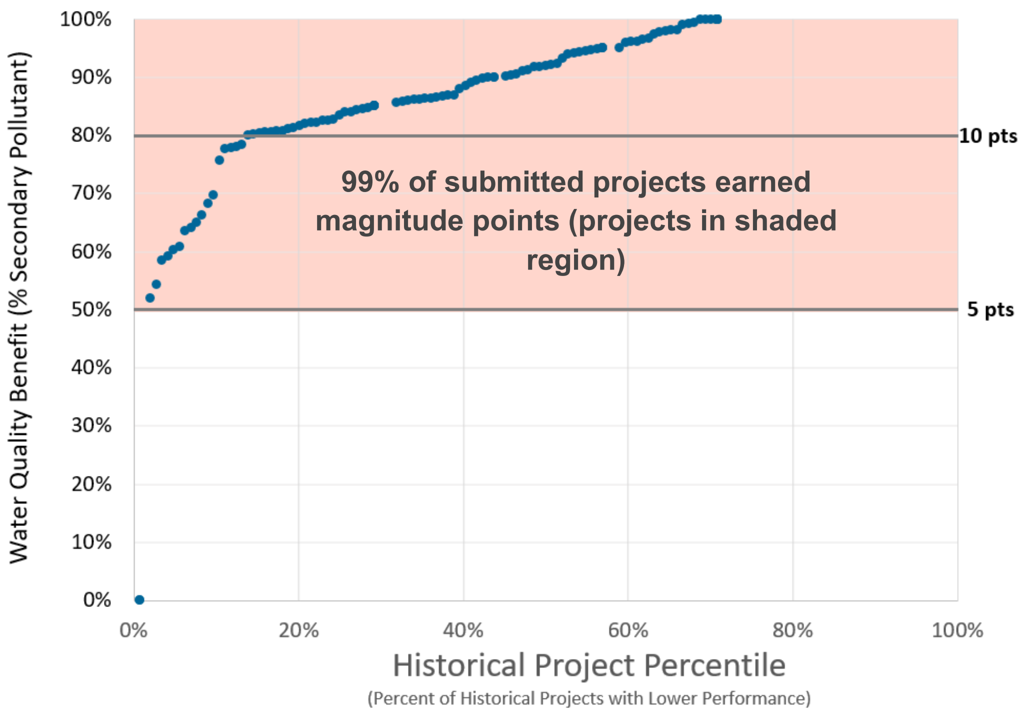

Figure 9. Distribution of Historical Wet Weather Project Water Quality Benefits for Secondary Pollutants Compared to Scoring Criteria

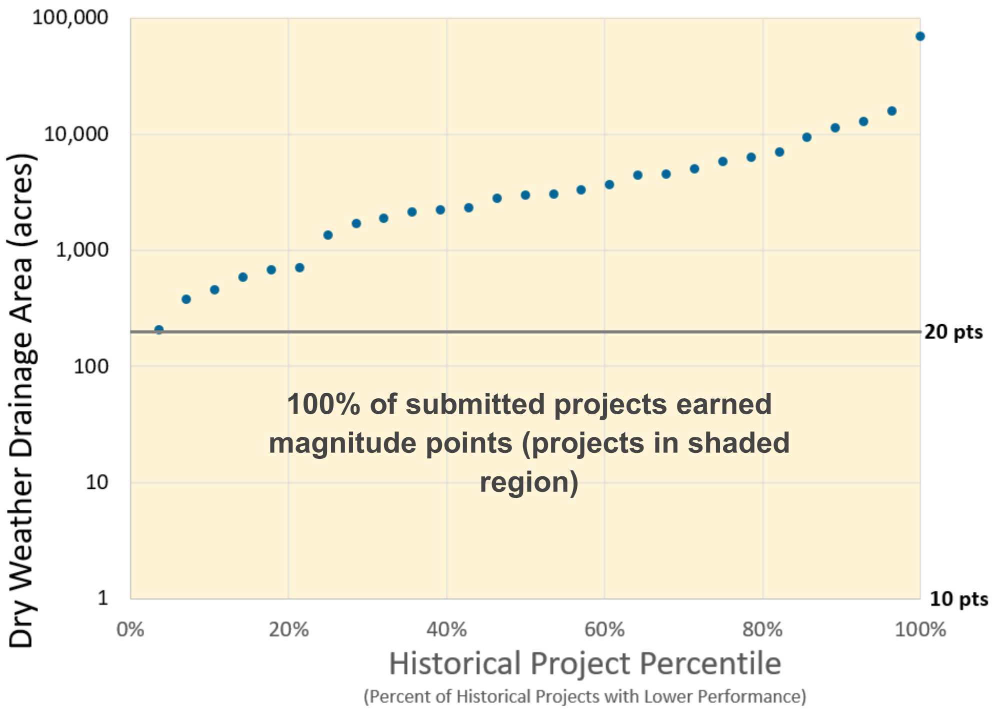

Figure 10. Distribution of Historical Dry Weather Project Water Quality Benefits for Tributary Drainage Area Compared to Scoring Criteria (note logarithmic scale)

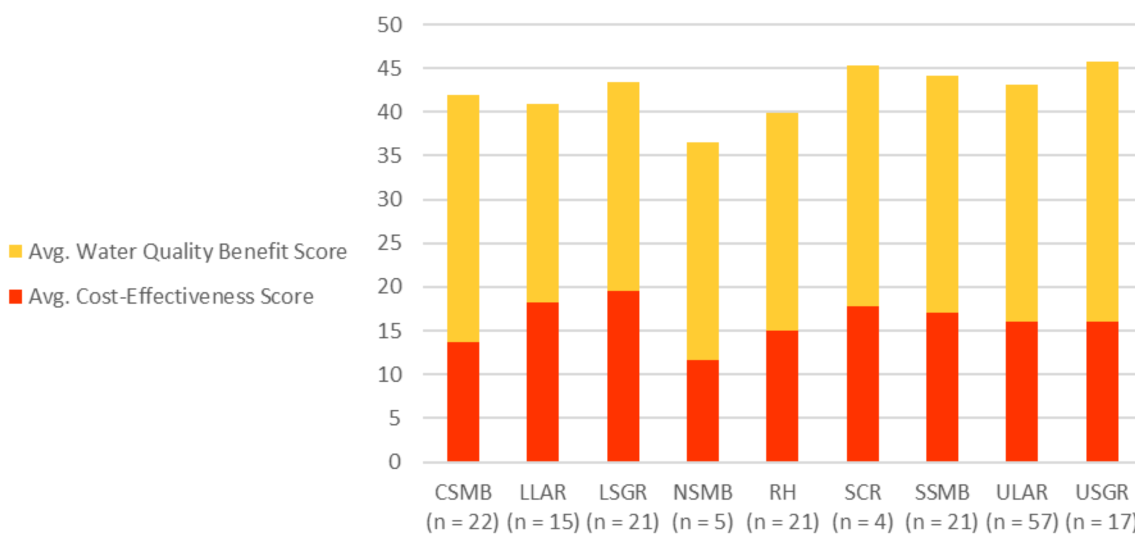

Figure 11. Average Cumulative Water Quality Points for Infrastructure Program Projects, by Watershed Area

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Alternative Scoring Approaches

The current Water Quality Benefit scoring criteria were originally developed by benchmarking the cost and performance of stormwater capture projects developed prior to 2018, whereas **the actual projects submitted to the Program to date adhere to different and more comprehensive rules and guidelines to provide multiple benefits and thus have inherently different costs and performance.** The historical project costs and performance presented in the previous section demonstrate what is possible throughout the Watershed Areas and also what is desired by project developers within the context of actual watershed opportunities and constraints, and within the bounds of the Program's rules and guidelines.

Approach 1: Adding Gradation to Current Scoring Rubrics

To add gradation the Water Quality Benefit scoring criteria, the point values missing from the rubric were added and the equivalent criteria were determined by interpolating point threshold values between the existing scoring rubric. These alternate scoring rubrics allow for points to be awarded in single-point increments. The graded rubric for cost-effectiveness is shown in Table 3 and Figure 12, for wet weather water quality benefits in Table 4, and Figure 13, and for dry weather water quality benefits in Table 5 and Figure 14.

Table 3. Gradation Added to Current Water Quality Cost Effectiveness / Dry Weather Capture Scoring Criteria

For Wet Weather BMPs only: Water Quality Cost Effectiveness (CE): (CE) = (24-Hours BMP Capacity) / (Capital Cost in $Millions) ($/AF)	Points
<0.12	0
0.12-0.169	1
0.17-0.219	2
0.22-0.259	3
0.26-0.309	4
0.31-0.349	5
0.35-0.399	6
0.4-0.449	7
0.45-0.489	8
0.49-0.539	9
0.54-0.579	10
0.58-0.629	11
0.63-0.679	12
0.68-0.719	13
0.72-0.769	14
0.77-0.819	15

For Wet Weather BMPs only: Water Quality Cost Effectiveness (CE): (CE) = (24-Hours BMP Capacity) / (Capital Cost in $Millions) ($/AF)	Points
0.82-0.859	16
0.86-0.909	17
0.91-0.949	18
0.95-0.999	19
≥1.0	20
For Dry-weather BMPs Only: Projects must be designed to capture, infiltrate, treat and release or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows	20

Table 4. Gradation Added to Current Water Quality Benefit Scoring Rubric, Wet Weather Projects

For Wet Weather BMPs only: Water Quality Benefit: Percent of influent pollutants treated by BMP on an average annual basis over a 10-year period using WMMS model (30 points max)		Primary Pollutant Points	Secondary Pollutant Points
Primary	**Secondary**		
<3%	<10%	0	0
3.1-6.9%	10.0–19.9%	1	1
7.0–9.9%	20.0–29.9%	2	2
10.0–12.9%	30.0–39.9%	3	3
13.0–16.9%	40.0–49.9%	4	4
17.0–19.9%	50.0–55.9%	5	5
20.0–22.9%	56.0–61.9%	6	6
23.0–26.9%	62.0–67.9%	7	7
27.0–29.9%	68.0–73.9%	8	8
30.0–32.9%	74.0–79.9%	9	9
33.0–36.9%	≥80%	10	10
37.0–39.9%		11	
40.0–42.9%		12	
43.0–46.9%		13	
47.0–49.9%		14	
50.0–55.9%		15	
56.0–61.9%		16	
62.0–67.9%		17	
68.0–73.9%		18	
74.0–79.9%		19	
≥80%		20	

Table 5. Gradation Added to Current Cost-Effectiveness Scoring Rubric, Dry Weather Projects

For Dry-weather BMPs Only: For Dry-weather BMPs Only: Tributary size of Dry Weather BMP (acres) (20 points max)	Points
< 20	10
20.0–39.9	11
40.0–59.9	12
60.0–79.9	13
80.0–99.9	14
100.0–119.9	15
120.0–139.9	16
140.0–159.9	17
160.0–179.9	18
180.0–199.9	19
≥200	20

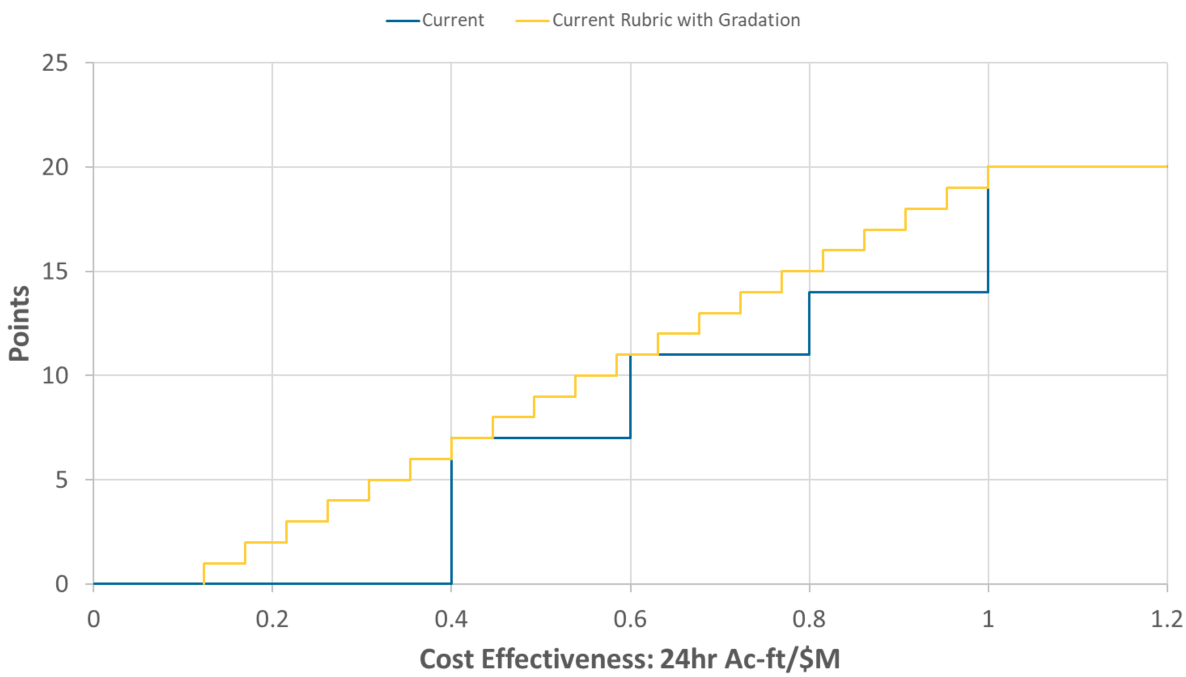

Figure 12. Gradation Added to Current Cost-Effectiveness Scoring Rubric

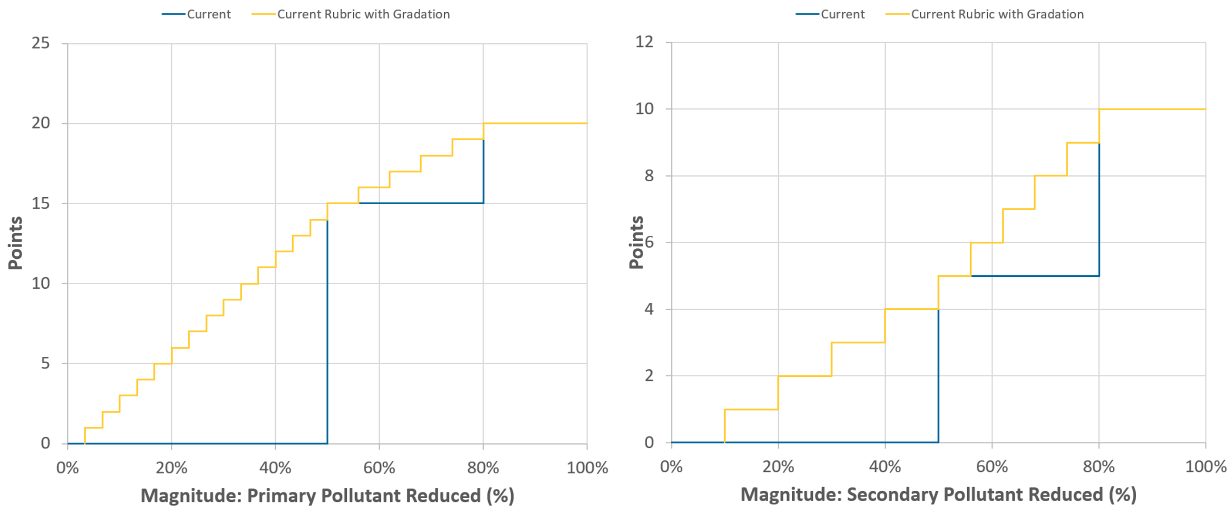

Figure 13. Gradation Added to Current Magnitude Scoring Rubric

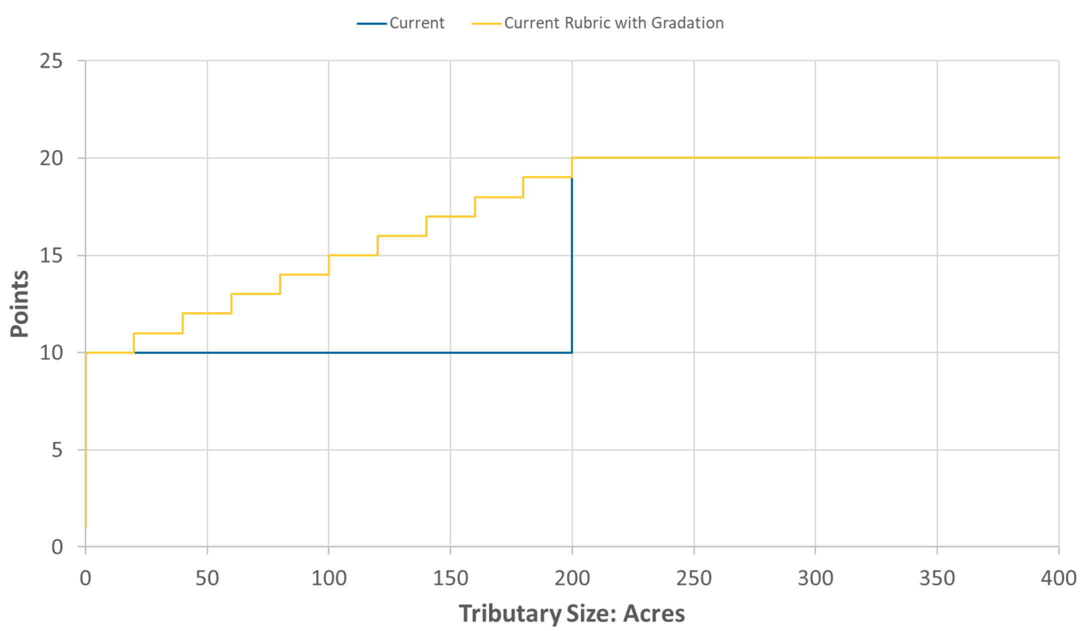

Figure 14. Gradation Added to Current Water Quality Benefit Scoring Rubric for Dry Weather Projects

Programmatic Impact

The projects historically submitted to the Program were re-scored using the graded Water Quality Benefit scoring criteria above to evaluate how the alternative criteria could impact Program-wide scoring trends. Figure 15 charts average scores by Watershed Area. Figure 16 through Figure 19 show how the calibrated criteria align with the distribution of historical project performance; note that under this alternative scoring rubric, 99% of projects receive Water Quality Benefit points.

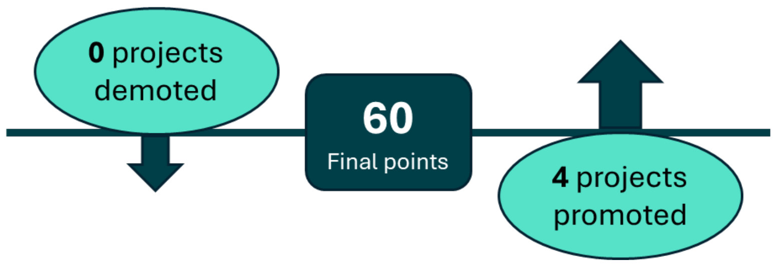

Table 6 reports statistics on the change in final project scores across all analyzed projects when the alternative criteria are applied compared to current criteria. Note that due to missing data, the number of projects receiving a final score is less than those included to calculate single category scores**. On average, the alternative criteria could increase cost-effectiveness scores by 1.0 points and modestly increase Water Quality Benefit scores by 0.5 points. The application of these calibrated score criteria may result in 4 out of 138 projects increasing from below to above the 60-point threshold, and 0 out of 138 projects' final scores dropping below the 60-point threshold.** Final scores could increase for 72 out of 138 projects and would decrease for zero. This alternative approach could be desirable as it provides a greater degree of specificity to the point awards, more evenly distributes historical projects across the point range, and may improve overall scoring outcomes for many projects without detracting from the scoring of any. This means that use of this scoring method would not create an unfair disadvantage in new project applications.

Table 6. Change in Score with Gradation Added to Current Scoring

Change from Current Criteria	Add Gradation to Current Scoring: Cost-Effectiveness	Add Gradation to Current Scoring: Magnitude
Largest Decrease	0.0	0.0
Mean	0.8	0.5
Largest Increase	6.0	8.0

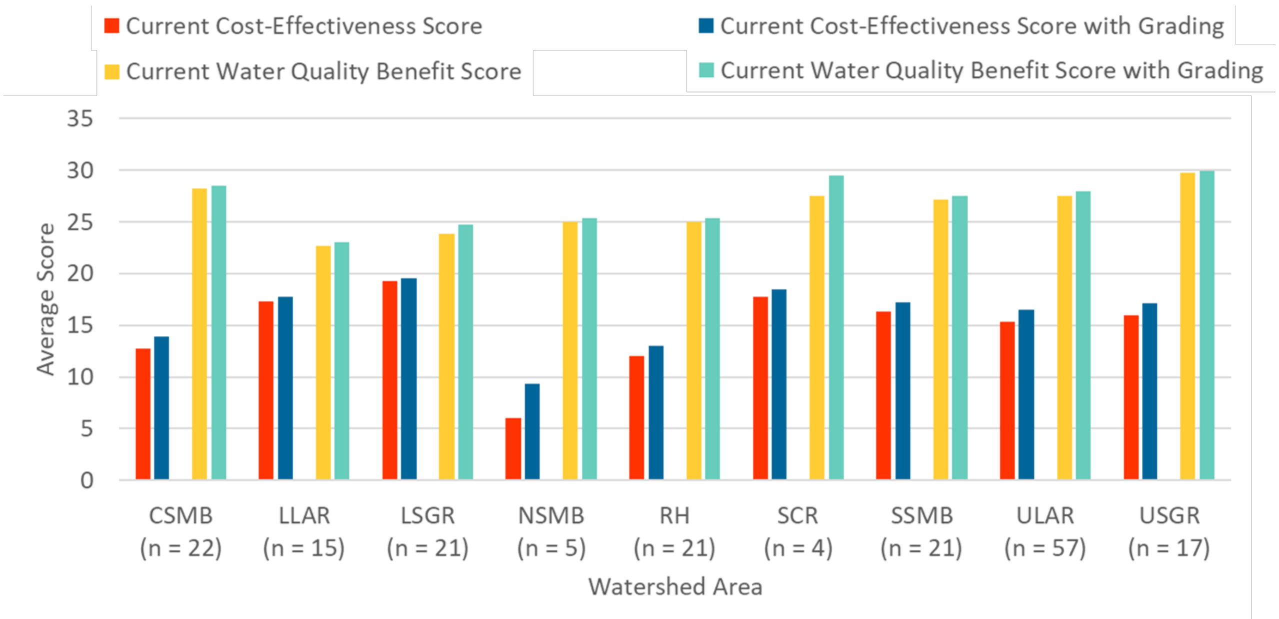

Figure 15. Average Scores with Gradation Added to Current Criteria Compared to Current Criteria, by Watershed Area

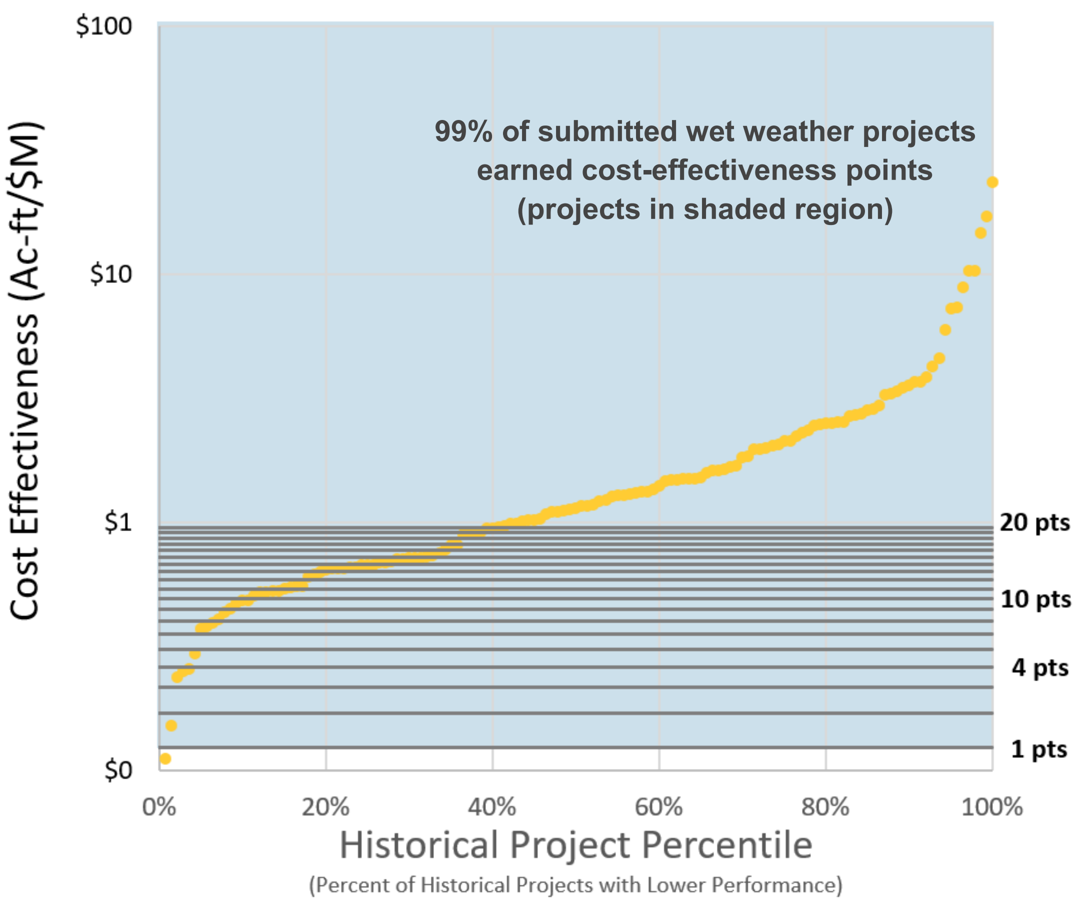

Figure 16. Distribution of Historical Project Cost-Effectiveness Compared to Scoring Criteria (note logarithmic scale)

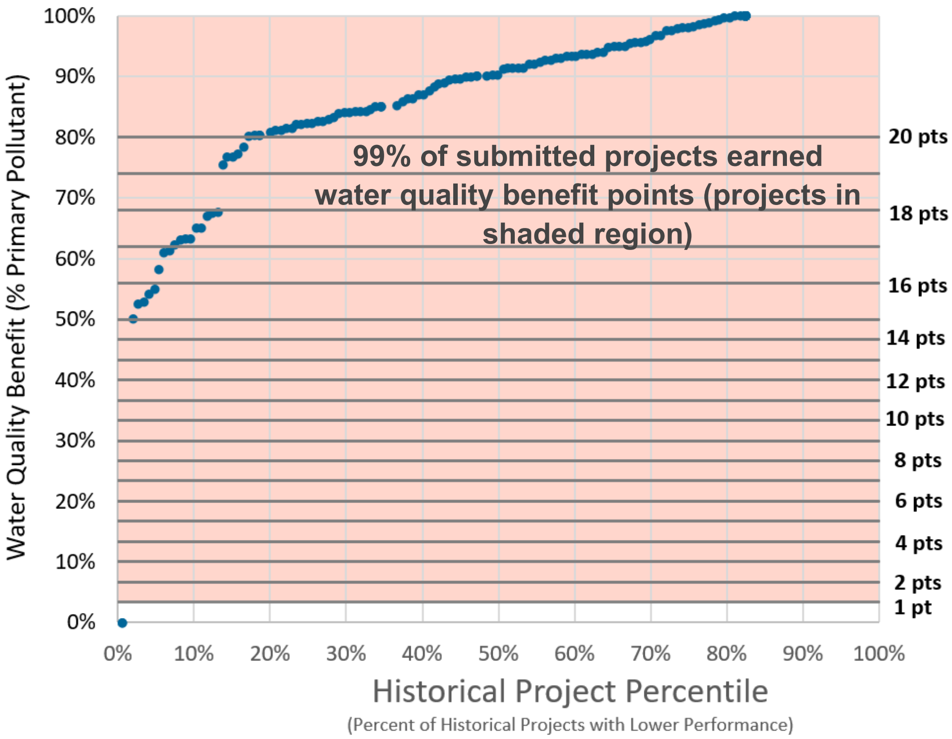

Figure 17. Distribution of Historical Wet Weather Project Water Quality Benefits for Primary Pollutants Compared to Scoring Criteria

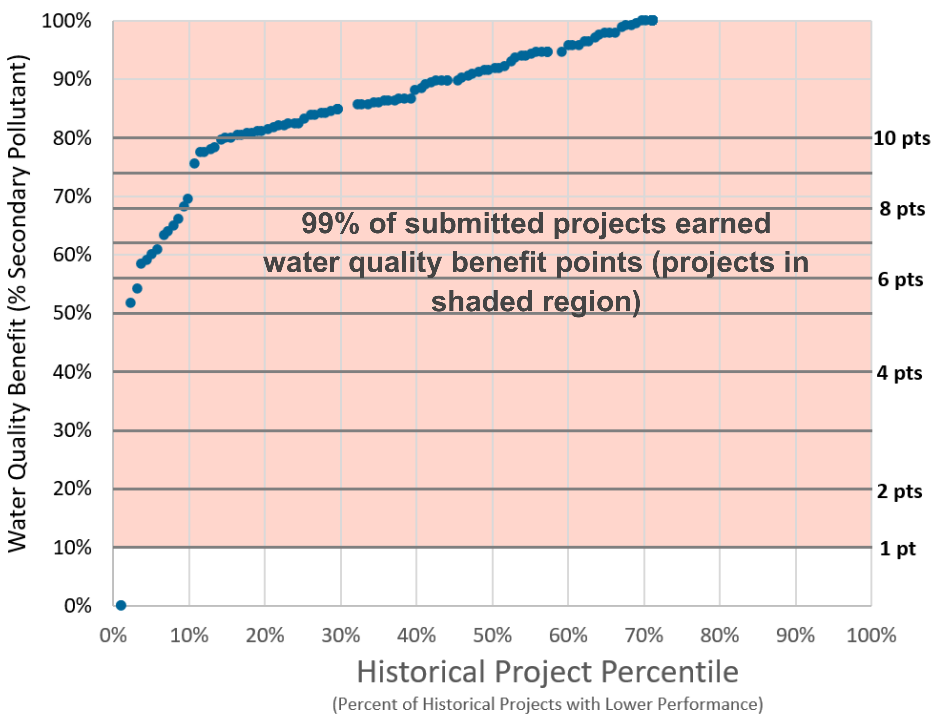

Figure 18. Distribution of Historical Wet Weather Project Water Quality Benefits for Secondary Pollutants Compared to Scoring Criteria

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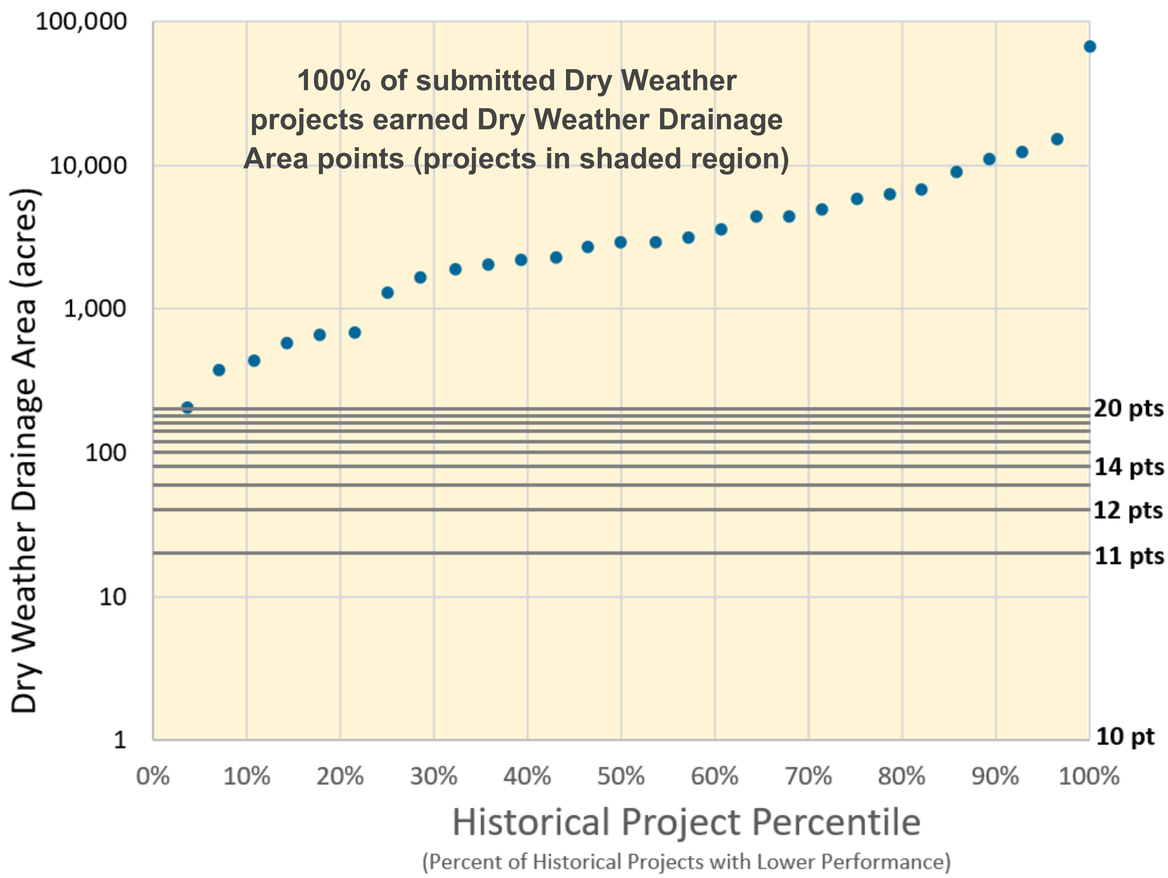

Figure 19. Distribution of Historical Dry Weather Project Water Quality Benefits for Tributary Drainage Area Compared to Scoring Criteria (note logarithmic scale)

Approach 2: Providing an Alternative Cost-Effectiveness Rubric Based on 85th Percentile Storm Runoff Volume

The current scoring metric for wet weather BMP cost-effectiveness is based on the 24-hour storage capacity of a project compared to its capital cost; however, a project's ability to capture runoff and pollutants is determined by the amount of runoff and pollutants it receives in addition to its capacity. The scoring guidelines state that: "*Management of the 24-hour event is considered the maximum capacity of a project for a 24-hour period. For water quality focused projects, this would typically be the 85th percentile design storm capacity.*" Additionally, the designation of a project as a wet weather project carries the assumption that a project can capture the full 85th percentile design storm.

To explore the implications of using the 85th percentile storm runoff capture volume in place of the 24-hour capacity, a coarse estimate of 85th percentile storm runoff volume was calculated based on the module-stated impervious area draining to each project and the 85th percentile storm depth at each project's location. **It is important to note that this estimate is based on assumed capture of the 85th percentile runoff volume, under the assumption that projects designated as "Wet" are capable of capturing this amount**. **These estimates should be further verified using runoff *capture* estimates generated by pending updates to the Projects Module.** Proposed adaptations will account for project diversion and storage capabilities of a project, which allows the estimation of the volume actually captured during an 85th percentile storm event.

24-hour volume capacity per dollar and 85th percentile storm runoff volume per dollar were compared with pollutant capture per dollar in Figure 20. The results suggest that cost effectiveness calculated with 85th percentile storm capture volumes are much more correlated with pollutant capture efficiency and the alternative approach may be more aligned with Water Quality Benefits.

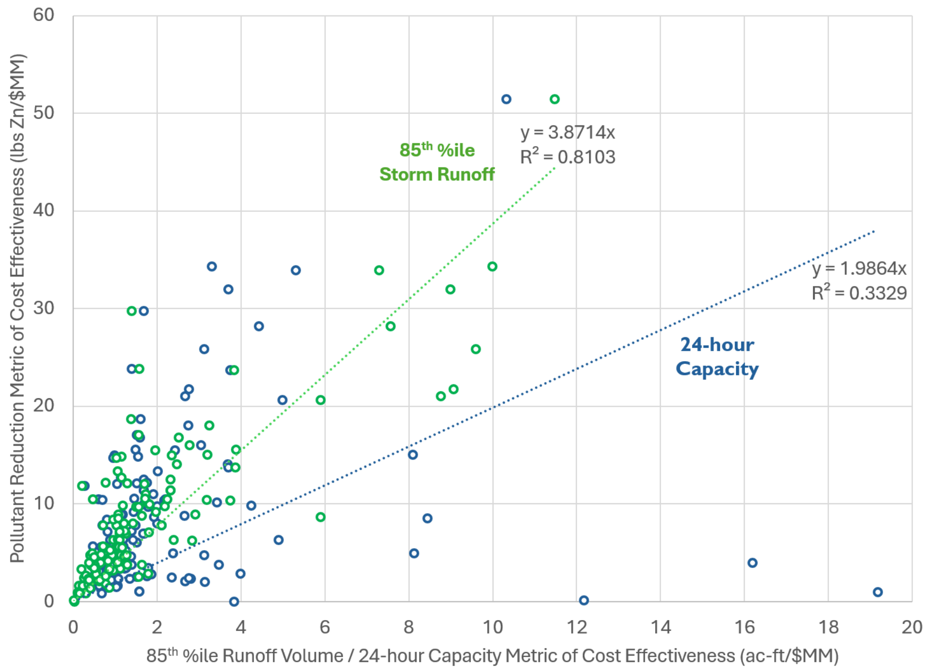

Figure 20. Comparison of Alternate Cost-Effectiveness Criteria (X-axis) Against a Pollutant Capture-Based Cost-Effectiveness (pounds of Zinc captured per $million in capital cost) (Y-axis).

For this alternative approach, cost-effectiveness scores were calculated using the 85th percentile storm volume (calculated as described above) and applied to the same rubric ranges as found in Alternative 1. These values are listed again below in Table 7 and pictured in Figure 21. If this approach were implemented, an optional strategy would be to allow project developers the option to choose between project capacity or design storm capture volume when computing the Water Quality Cost Effectiveness score.

Table 7. Water Quality Cost Effectiveness / Dry Weather Capture Scoring Criteria, Using 85th Percentile Storm Runoff Volume, with Gradation

For Wet Weather BMPs only: Water Quality Cost Effectiveness (CE): (CE) = (85th Percentile Storm Runoff Volume) / (Capital Cost in $Millions) ($/AF)	Points
<0.12	0
0.12-0.169	1
0.17-0.219	2
0.22-0.259	3
0.26-0.309	4
0.31-0.349	5
0.35-0.399	6
0.4-0.449	7
0.45-0.489	8
0.49-0.539	9
0.54-0.579	10
0.58-0.629	11
0.63-0.679	12
0.68-0.719	13
0.72-0.769	14
0.77-0.819	15
0.82-0.859	16
0.86-0.909	17
0.91-0.949	18
0.95-0.999	19
≥1.0	20
For Dry-weather BMPs Only: Projects must be designed to capture, infiltrate, treat and release or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows	20

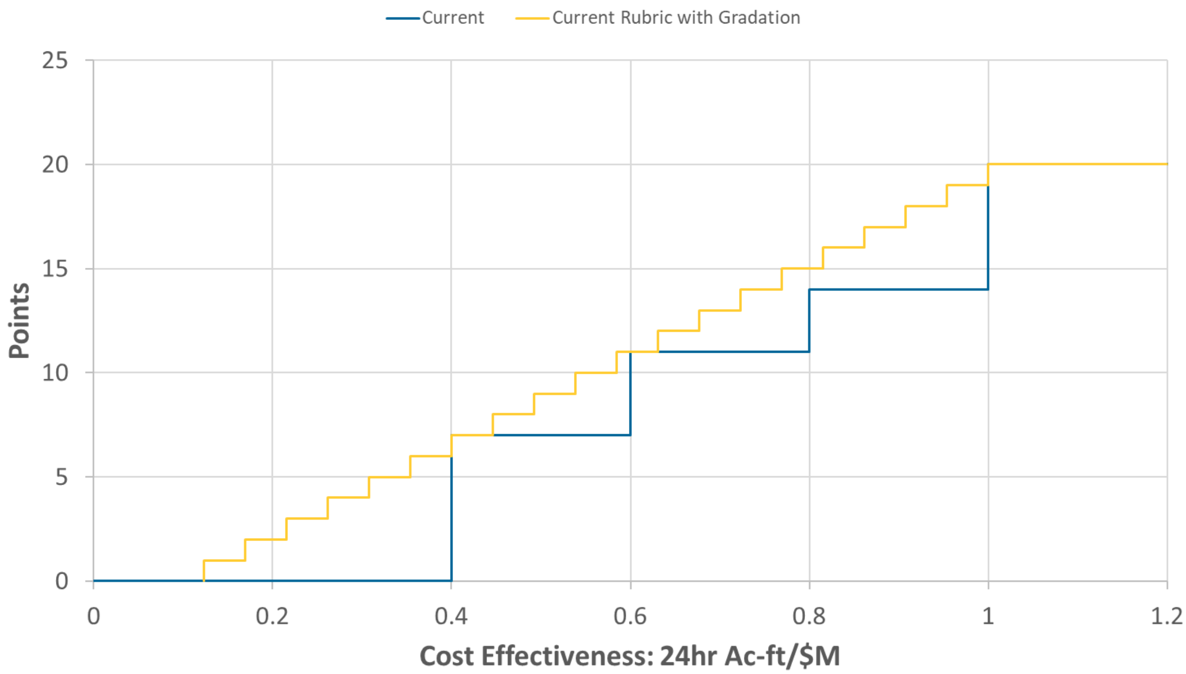

Figure 21. Cost-Effectiveness Scoring Rubric Using the 85th Percentile Storm Runoff Volume, with Gradation

Programmatic Impact

The projects historically submitted to the Program were re-scored using the 85th percentile storm volume alternative cost-effectiveness scoring criteria above to evaluate how the alternative criteria could impact Program-wide scoring trends. Figure 22 charts average scores by Watershed Area. Figure 23 shows how the calibrated criteria align with the distribution of historical project performance; note that under this alternative scoring rubric, 98% of projects receive cost-effectiveness points.

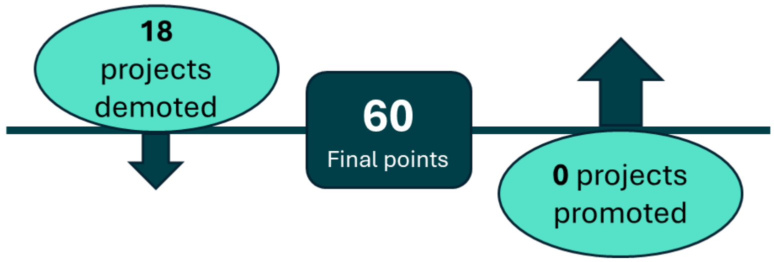

Table 8-reports statistics on the change in final project scores across all analyzed projects when the alternative criteria are applied compared to current criteria. **On average, the alternative criteria could decrease cost-effectiveness scores by 1.9 points. The application of these calibrated score criteria may result in 0 out of 142 projects increasing from below to above the 60-point threshold, and 18 out of 142 projects' final scores dropping below the 60-point threshold.** Final scores could increase for 28 out of 142 projects and decrease for 40 out of 142. Decreases in scores mostly have to do with a large number of projects scoring high point values under current scoring rubrics. **If project developers were given the choice of the best between this alternative approach and the current metrics, it would result in final scores decreasing for none of the projects**, and a mean increase in score by 1.3 points. This alternative approach that gives developers a choice in which metric to apply could be desirable as it provides a greater degree of specificity to the point awards, more evenly distributes historical projects across the point range, and improves overall scoring outcomes for many projects without detracting from the scoring of any. Additionally, the use of the 85th percentile storm runoff volume is more aligned with the goal of reducing runoff and pollutants to improve water quality. With the option to choose this approach or approach 1, use of this scoring method would not create an unfair disadvantage in new project applications.

Table 8. Change in Score Under Criteria Using 85th Percentile Storm Runoff Volumes

Change from Current Criteria	Add Gradation to Current Scoring: Cost-Effectiveness	Choice of 85th percentile or Current Cost Effectiveness
Largest Decrease	-20.0	0.0
Mean	-1.9	1.3
Largest Increase	9.0	9.0

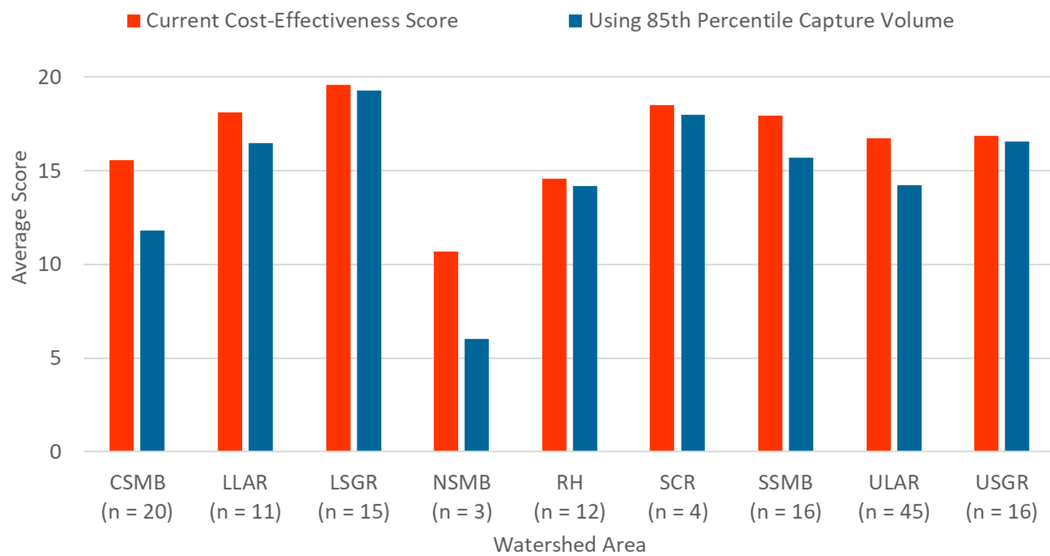

Figure 22. Average Scores Using 85th Percentile Storm Runoff Volume Compared to Current Criteria, by Watershed Area

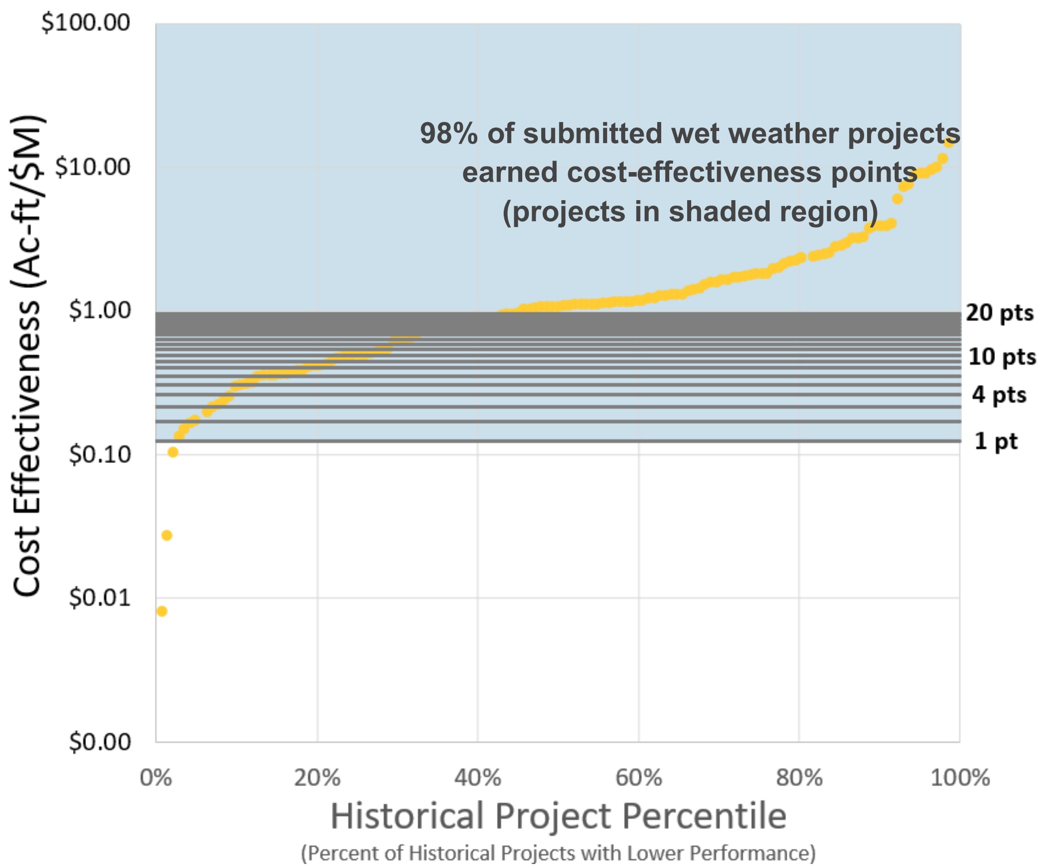

Figure 23. Distribution of Historical Project Cost-Effectiveness Compared to Scoring Criteria (note logarithmic scale)

Approach 3: Calibrating Score Ranges to Historical Projects

Since the inception of the Program, valuable data have been generated for each project pertaining to the expected design characteristics and project performance. This information can be leveraged to provide regionally specific distributions of realized project data to help evaluate future applications. Similar to the alternative approaches presented in the Water Supply Scoring Adaptation Pilot Rubrics Memo, this approach explores the implications of revising the scoring rubric point value ranges based on all project applications over the course of the Program thus far.

To perform this “calibration” on the Water Quality Benefit scoring criteria to accommodate the range of historical Program projects, the rubric was evenly scaled across historical project cost-effectiveness and magnitude percentiles, and are listed in Table 9 and Table 10. For example, 55 percent of projects submitted to the Program to date claimed cost-effectiveness exceeding 1.2 $/AF, so projects capturing over 1.2 $/AF would earn 55 percent of the maximum points (11 out of 20 cost-effectiveness points); similarly, 70 percent of projects submitted to date claim capture magnitude of 1.5 $/AF or less, so projects in the 70th percentile (over 1.5 $/AF) would earn 70 percent of the total possible points (14 out of 20 cost-effectiveness points). This scoring rubric creates an outcome with project scores that are more representative of the range of project characteristics submitted to the program. (Under current scoring rubrics, 31% of projects included in this analysis received the maximum points possible for Water Quality Benefits). The histograms shown below in Figure 27 through Figure 29 show the difference in distribution of scores between the current and calibrated score rubrics.

Table 9. Water Quality Cost Effectiveness / Dry Weather Capture Scoring Criteria Calibrated to Historical Projects

For Wet Weather BMPs only: Water Quality Cost Effectiveness (CE): **(CE) = (24-Hours BMP Capacity) / (Capital Cost in $Millions) ($/AF)**	**Points**
< 0.70	0
0.70–1.19	7
1.20–1.49	11
1.50–7.29	14
≥7.3	20
For Dry-weather BMPs Only: Projects must be designed to capture, infiltrate, treat and release or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows	20

Table 10. Water Quality Benefit / Dry Weather Tributary Size Scoring Criteria Calibrated to Historical Projects

For Wet Weather BMPs only: Water Quality Benefit: Percent of influent pollutants treated by BMP on an average annual basis over a 10-year period using WMMS model (30 points max)		Primary Pollutant Points	Secondary Pollutant Points
Primary	Secondary		
≥92%	≥82%	15	5
≥99.6%	≥99.9%	20	10
For Dry-weather BMPs Only: For Dry-weather BMPs Only: Tributary size of Dry Weather BMP (acres) (20 points max)		Points	
<2800		10	
≥2800		20	

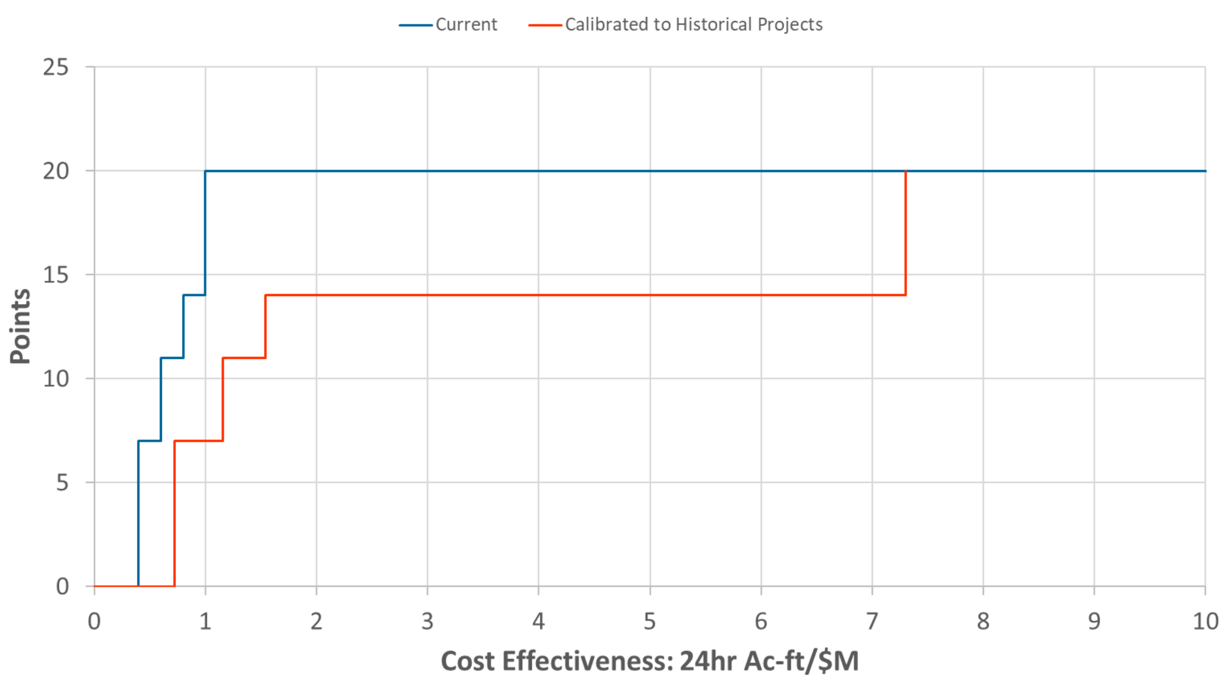

Figure 24. Cost-Effectiveness Scoring Rubric Calibrated to Historical Projects

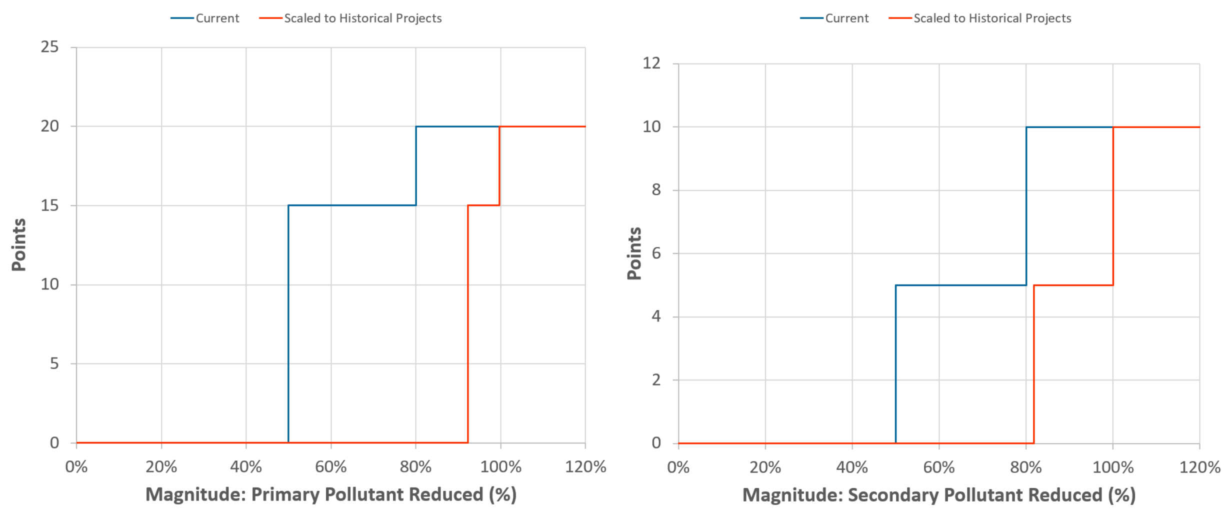

Figure 25. Magnitude Scoring Rubric Calibrated to Historical Projects

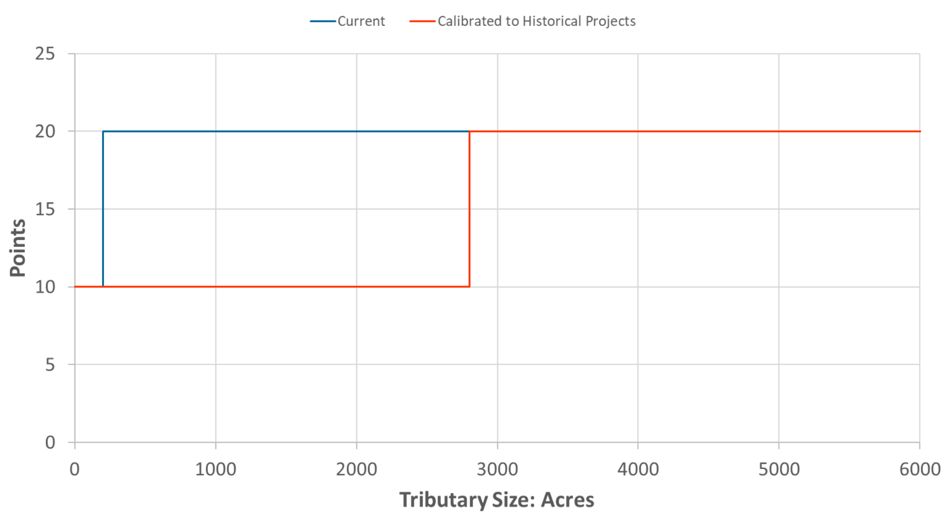

Figure 26. Water Quality Benefit Scoring Rubric for Dry Weather Projects

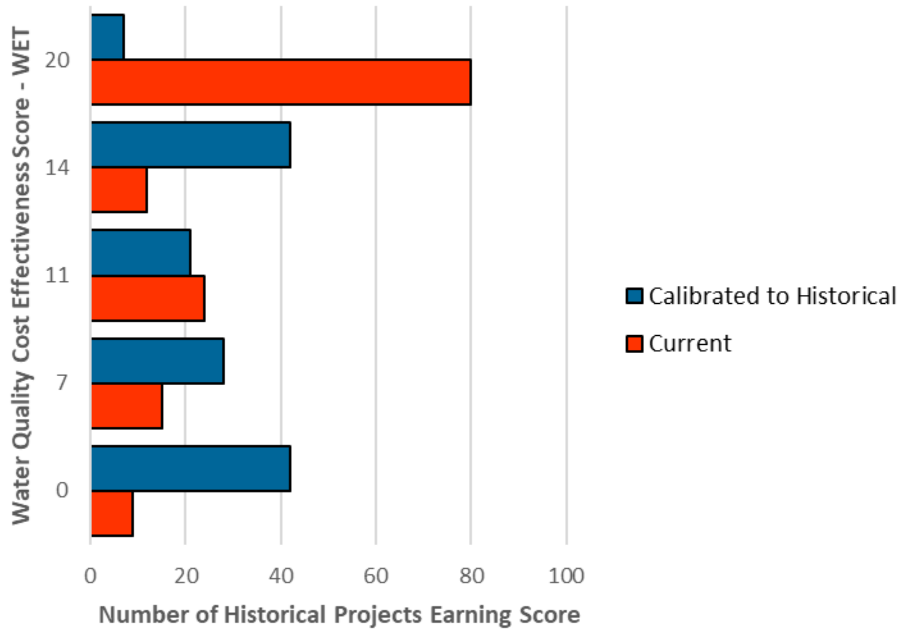

Figure 27. Histogram of Historical Cost-Effectiveness Scores Under Current Rubric Compared to the Historically Calibrated Rubric

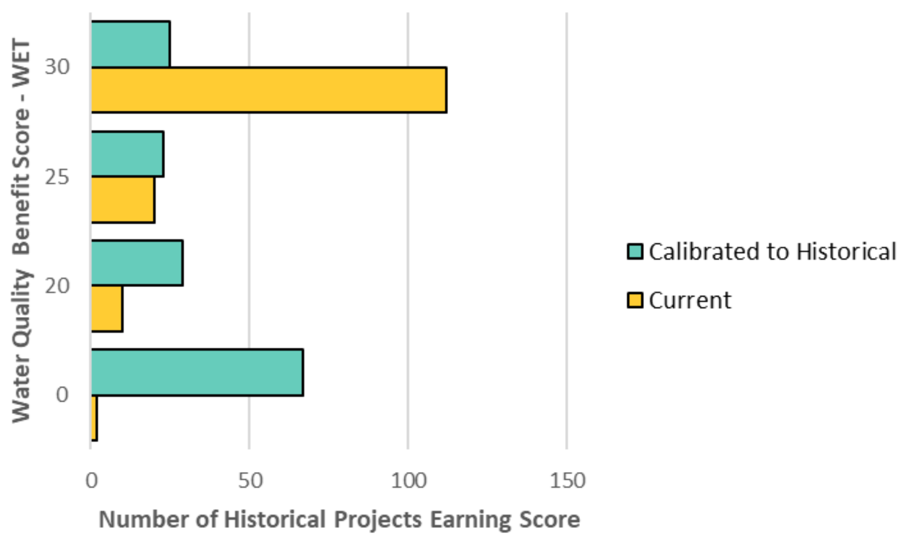

Figure 28. Histogram of Historical Quality Benefit Scores for Wet Weather Projects Under Current Rubric Compared to the Historically Calibrated Rubric

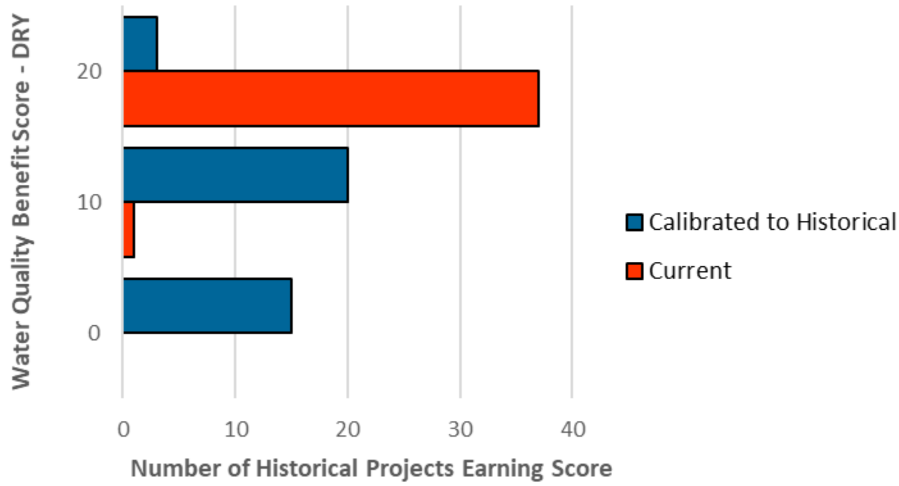

Figure 29. Histogram of Historical Quality Benefit Scores for Dry Weather Projects Under Current Rubric Compared to the Historically Calibrated Rubric

Programmatic Impact

The projects historically submitted to the Program were re-scored using the calibrated Water Quality Benefit scoring criteria above to evaluate how the alternative criteria could impact Program-wide scoring trends. Figure 30 charts average scores by Watershed Area. Figure 31 through Figure 34 show how the calibrated criteria align with the distribution of historical project performance. 70% of submitted projects earned cost-effectiveness points, 45% of submitted projects earned primary pollutant water quality benefit points (80% for secondary pollutants), and 100% of submitted dry weather projects earn tributary drainage area size points.

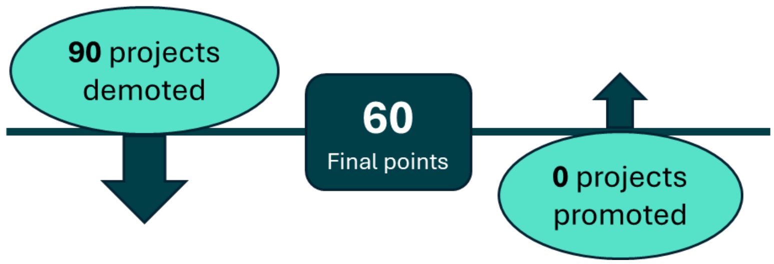

Table 11 reports statistics on the change in final project scores across all analyzed projects when the alternative criteria are applied. Note that due to missing data, the number of projects receiving a final score is less than those included to calculate single category scores. **On average, the alternative criteria could substantially decrease cost-effectiveness scores by 7.0 points and decrease Water Quality Benefit scores by 12.7 points. The application of these calibrated score criteria may result in zero projects increasing from below to above the 60-point threshold, and 90 out of 138 projects' final scores dropping below the 60-point threshold.** Final scores would not increase for any projects and could decrease for 135 out of 138. Decreases in scores mostly have to do with a large number of projects scoring high point values under current scoring rubrics. While this alternative scoring criteria better characterizes the range of historic project applications, many scores could be reduced. This means that use of this scoring method could potentially create an unfair disadvantage in new project applications. Application of this approach is not recommended.

Table 11. Change in Score Under Criteria Calibrated to Historical Projects

Change from Current Criteria	Calibrating to Historical Data: Cost-Effectiveness	Calibrating to Historical Data: Water Quality Benefit
Largest Decrease	-13.0	-30.0
Mean	-5.4	-12.5
Largest Increase	0.0	0.0

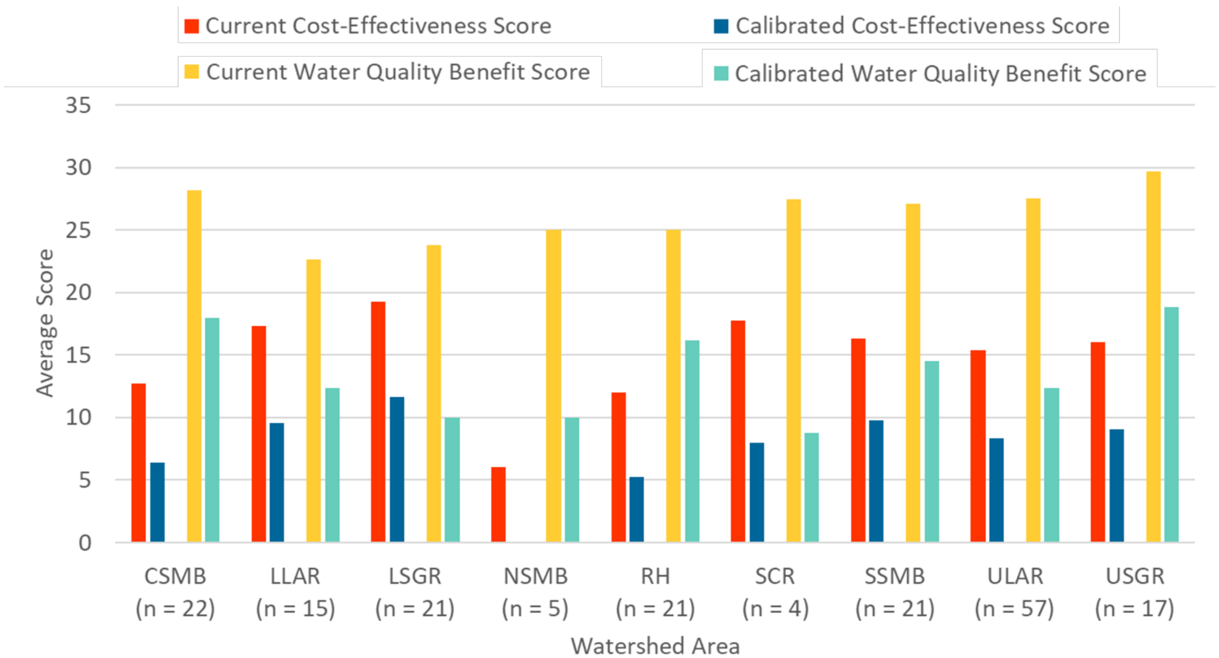

Figure 30. Average Scores Using Criteria Calibrated with Historical Projects Compared to Current Criteria, by Watershed Area

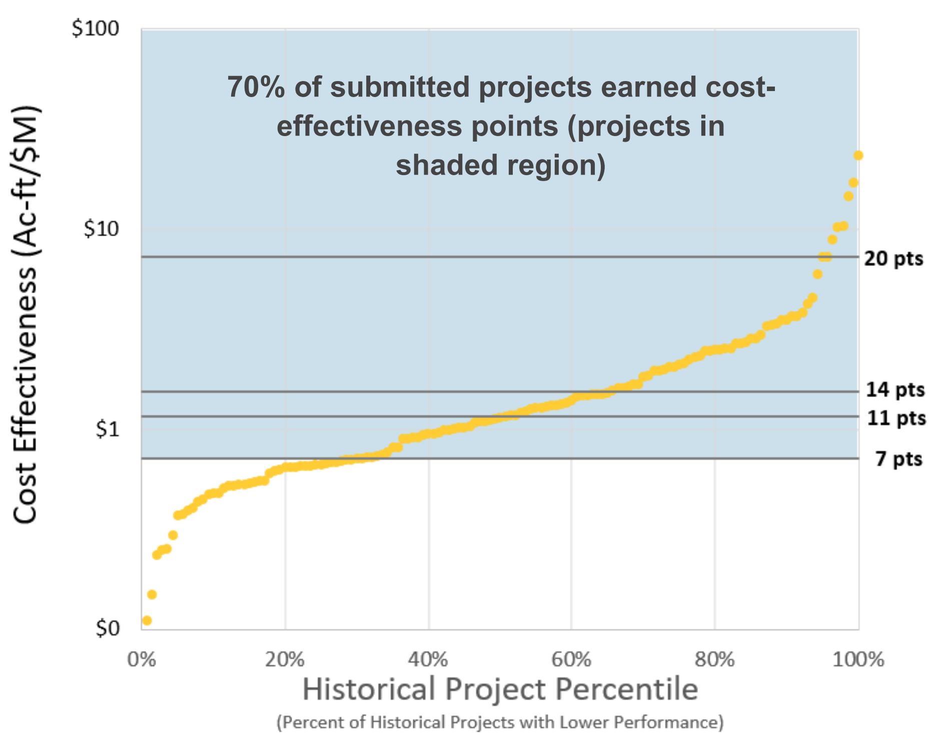

Figure 31. Distribution of Historical Project Cost-Effectiveness Compared to Scoring Criteria (note logarithmic scale)

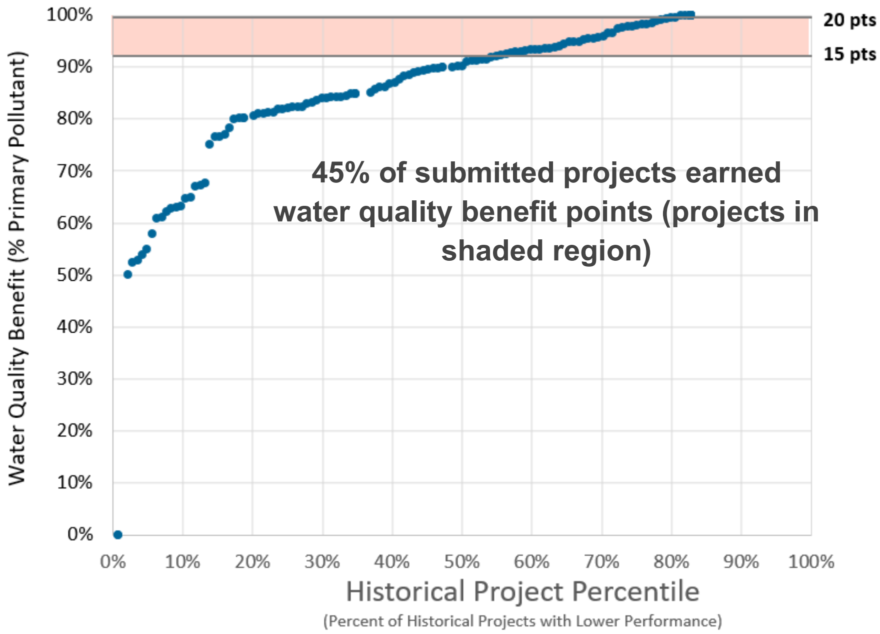

Figure 32. Distribution of Historical Wet Weather Project Water Quality Benefits for Primary Pollutants Compared to Scoring Criteria

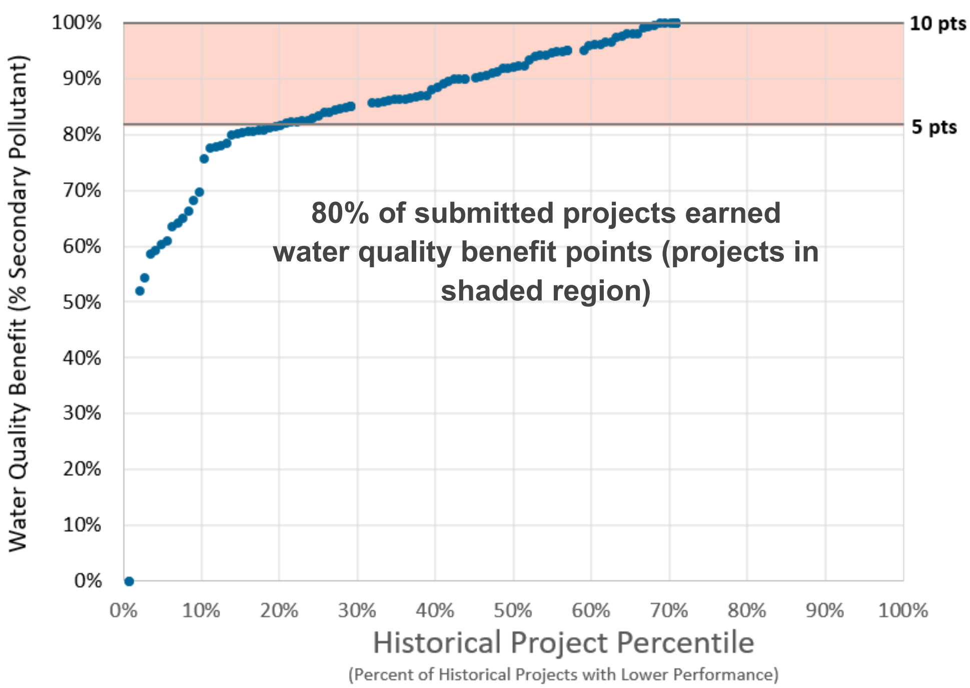

Figure 33. Distribution of Historical Wet Weather Project Water Quality Benefits for Secondary Pollutants Compared to Scoring Criteria

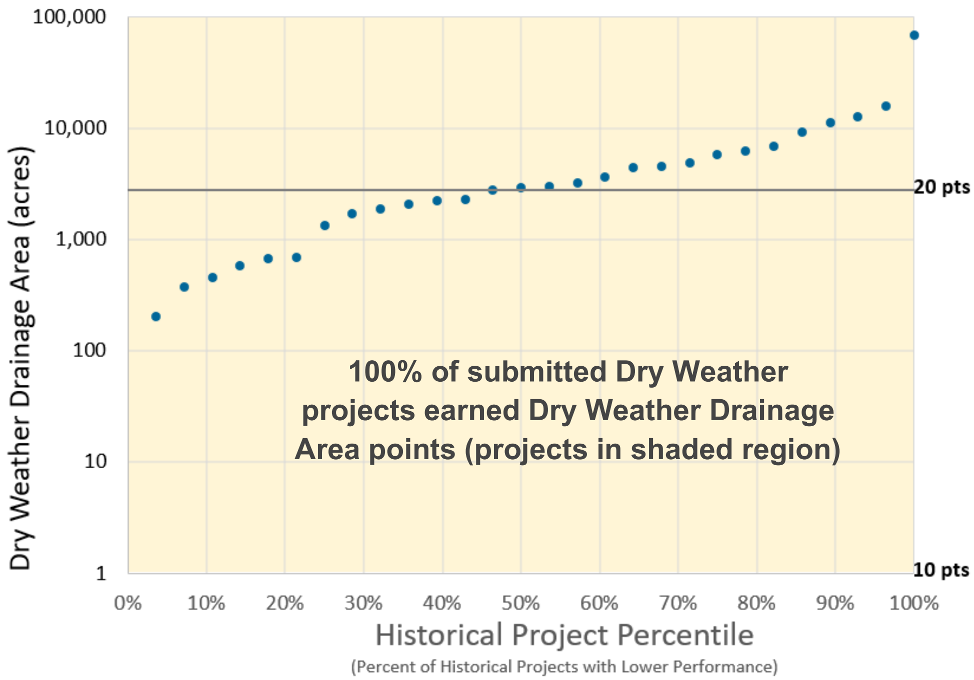

Figure 34. Distribution of historical dry weather project water quality benefits for tributary drainage area compared to scoring criteria (note logarithmic scale)

Approach 4: Adding Gradation to Historically Calibrated Scoring Rubrics

To calibrate the Water Quality Benefit scoring criteria to accommodate the range of historical Program projects, the rubric was evenly scaled using historical project cost-effectiveness and water quality benefit percentiles reported above in Figure 31 through Figure 34, the same way as was done for Approach 3. For this approach, however, points were awarded at single point increments across the full point ranges. The calibrated rubric for cost-effectiveness is shown in Table 12 and Figure 35, for wet weather water quality benefits in Table 13, and Figure 36, and for dry weather water quality benefits in Table 14 and Figure 37.

Table 12. Water Quality Cost Effectiveness / Dry Weather Capture Scoring Criteria Calibrated to Historical Projects with Gradation

For Wet Weather BMPs only: Water Quality Cost Effectiveness (CE): (CE) = (24-Hours BMP Capacity) / (Capital Cost in $Millions) ($/AF)	Points
<0.38	1
0.38-0.479	2
0.48–0.549	3
0.55–0.649	4
0.65–0.669	5
0.67–0.719	6
0.72–0.809	7
0.81–0.949	8
0.95–1.029	9
1.03–1.149	10
1.15–1.279	11
1.28–1.429	12
1.43–1.539	13
1.54–1.839	14
1.84–2.119	15
2.12–2.519	16
2.52–2.839	17
2.84–3.559	18
3.56–7.299	19
≥7.30	20
For Dry-weather BMPs Only: Projects must be designed to capture, infiltrate, treat and release or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows	20

Table 13. Water Quality Benefit Scoring Rubric Calibrated to Historical Project Data with Gradation, Wet Weather Projects

For Wet Weather BMPs only: Water Quality Benefit: Percent of influent pollutants treated by BMP on an average annual basis over a 10-year period using WMMS model (30 points max)		Primary Pollutant Points	Secondary Pollutant Points
Primary	Secondary		
<15%	<25%	1	1
15.0–28.9%	25.0–50.9%	2	2
29.0–43.9%	51.0–75.9%	3	3
44.0–57.9%	76.0–81.9%	4	4
58.0–64.9%	82.0–84.9%	5	5
65.0–76.9%	85.0–88.9%	6	6
77.0–80.9%	89.0–91.9%	7	7
81.0–81.9%	92.0–95.9%	8	8
82.0–83.9%	96.0–99.995%	9	9
84.0–84.9%	≥99.995%	10	10
85.0–86.9%		11	
87.0–89.9%		12	
90.0–90.9%		13	
91.0–91.9%		14	
92.0–92.9%		15	
93.0–94.9%		16	
95.0–95.9%		17	
96.0–97.9%		18	
98.0–99.5%		19	
≥99.6%		20	

Table 14. Graded and Calibrated Cost-Effectiveness Scoring Rubric Calibrated to Historical Project Data with Gradation, Dry Weather Projects

For Dry-weather BMPs Only: For Dry-weather BMPs Only: Tributary size of Dry Weather BMP (acres) (20 points max)	Points
<403	1
403.0–545.9	2
546.0–670.9	3
671.0–952.9	4
953.0–1609.9	5
1610.0–1899.9	6
1900.0–2149.9	7
2150.0–2279.9	8
2280.0–2799.9	9
2800.0–2969.9	10
2970.0–3219.9	11
3220.0–3819.9	12
3820.0–4459.9	13
4460.0–4899.9	14

For Dry-weather BMPs Only: For Dry-weather BMPs Only: Tributary size of Dry Weather BMP (acres) (20 points max)	Points
4900.0–5919.9	15
5920.0–6659.9	16
6660.0–9119.9	17
9120.0–11599.9	18
11600.0–14599.9	19
≥14600	20

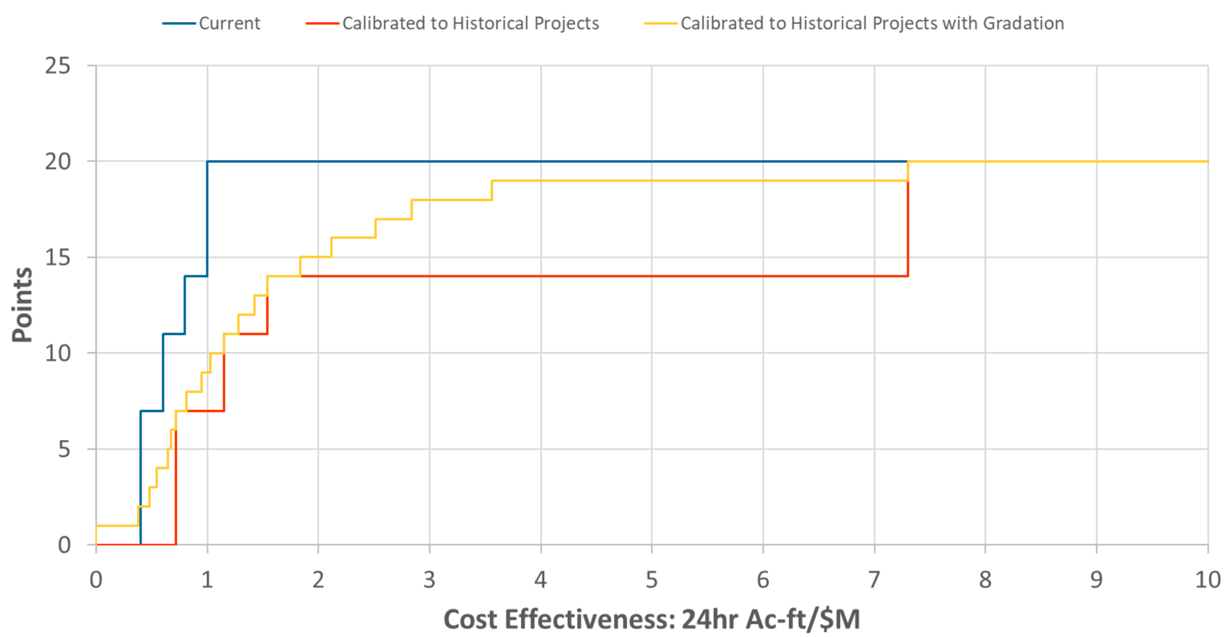

Figure 35. Cost-Effectiveness Scoring Rubric Calibrated to Historical Projects with Gradation

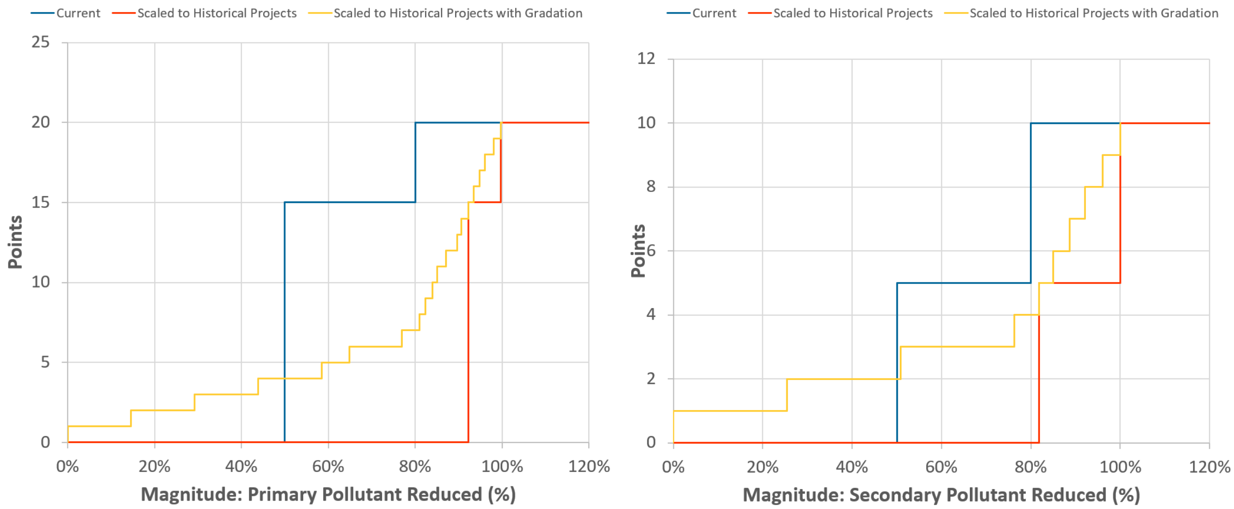

Figure 36. Magnitude Scoring Rubric Calibrated to Historical Projects with added Gradation

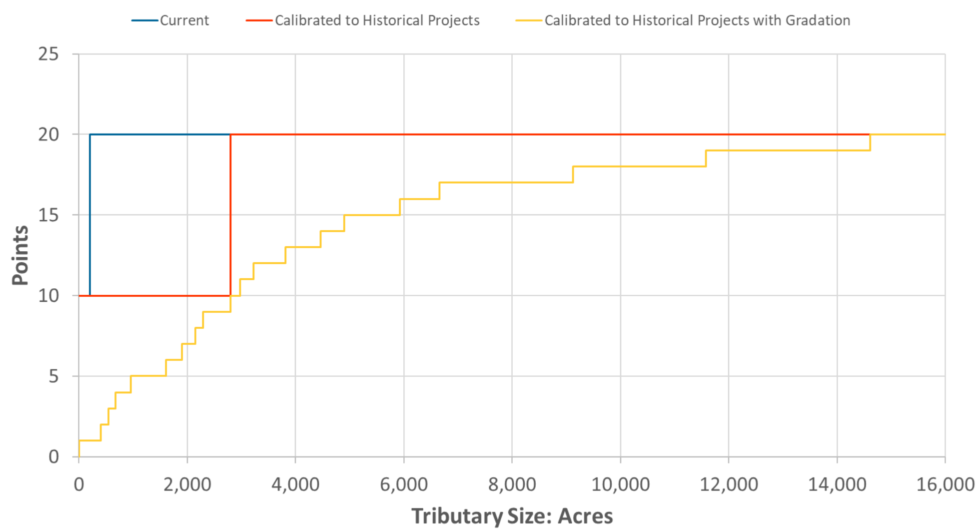

Figure 37. Water Quality Benefit Scoring Rubric for Dry Weather Projects Calibrated to Historical Projects with added Gradation

Programmatic Impact

The projects historically submitted to the Program were re-scored using the graded and calibrated Water Quality Benefit scoring criteria above to evaluate how the alternative criteria could impact Program-wide scoring trends. Figure 38 charts average scores by Watershed Area. Figure 39 through Figure 42 show how the calibrated criteria align with the distribution of historical project performance; note that under this alternative scoring rubric, 100% of projects receive Water Quality Benefit points.

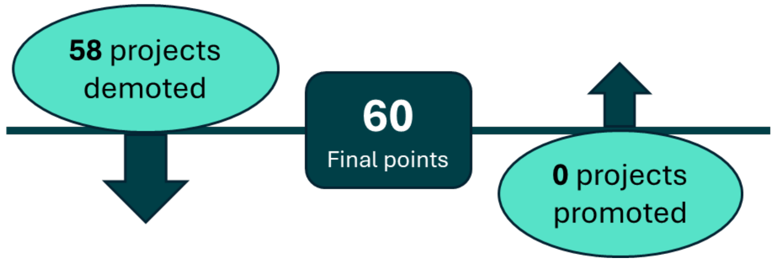

Table 15 reports statistics on the change in final project scores across all analyzed projects when the alternative criteria are applied to projects. Note that due to missing data, the number of projects receiving a final score is less than those included to calculate single category scores. **On average, the alternative criteria could substantially decrease cost-effectiveness scores by 4.8 points and decrease Water Quality Benefit scores by 8.1 points. The application of these calibrated score criteria may result in zero projects increasing from below to above the 60-point threshold, and 58 out of 138 projects' final scores dropping below the 60-point threshold.** Final scores could increase for 1 out of 138 projects and decrease for 135 out of 138 projects. Decreases in scores mostly have to do with a large number of projects scoring high point values under current scoring rubrics. This means that use of this scoring method could potentially create an unfair disadvantage in new project applications. While these alternative criteria are an improvement over approach 3 in that incremental points are applied, it is not recommended due to the drastic change from the current criteria.

Table 15. Change in Score Under Criteria Calibrated to Historical Projects with Gradation

Change from Current Criteria	Add Gradation + Historically Calibrated: Cost-Effectiveness	Add Gradation + Historically Calibrated: Magnitude
Largest Decrease	-11.0	-19.0
Mean	-3.6	-8.0
Largest Increase	2.0	2.0

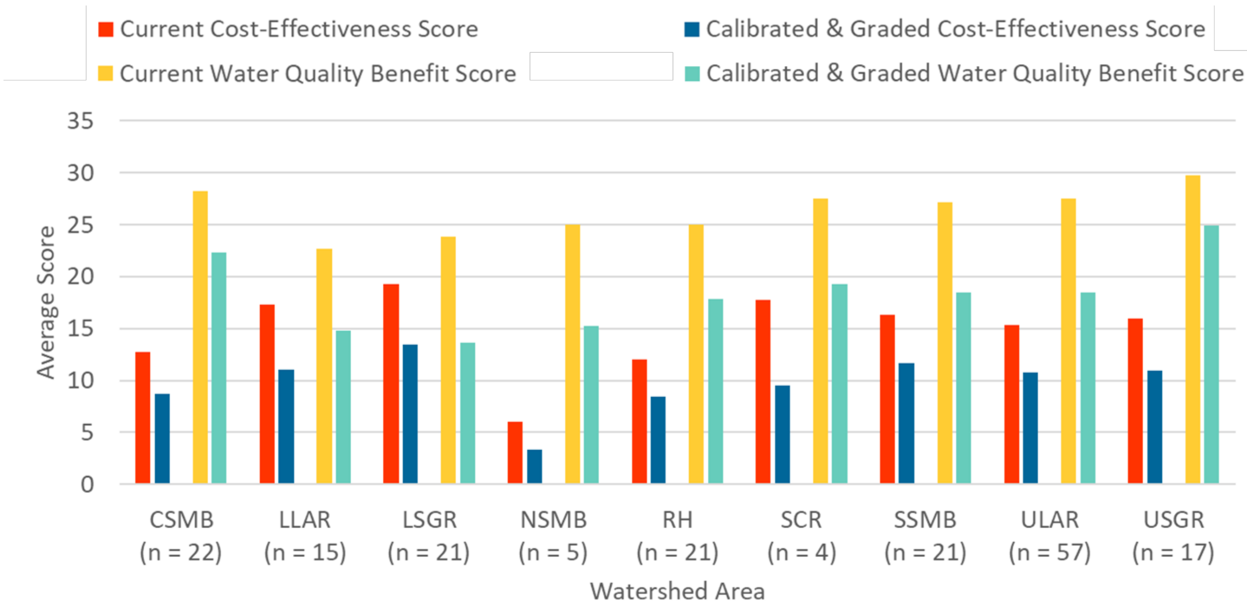

Figure 38. Average Scores Using Criteria Calibrated to Historical Projects with Gradation Compared to Current Criteria, by Watershed Area

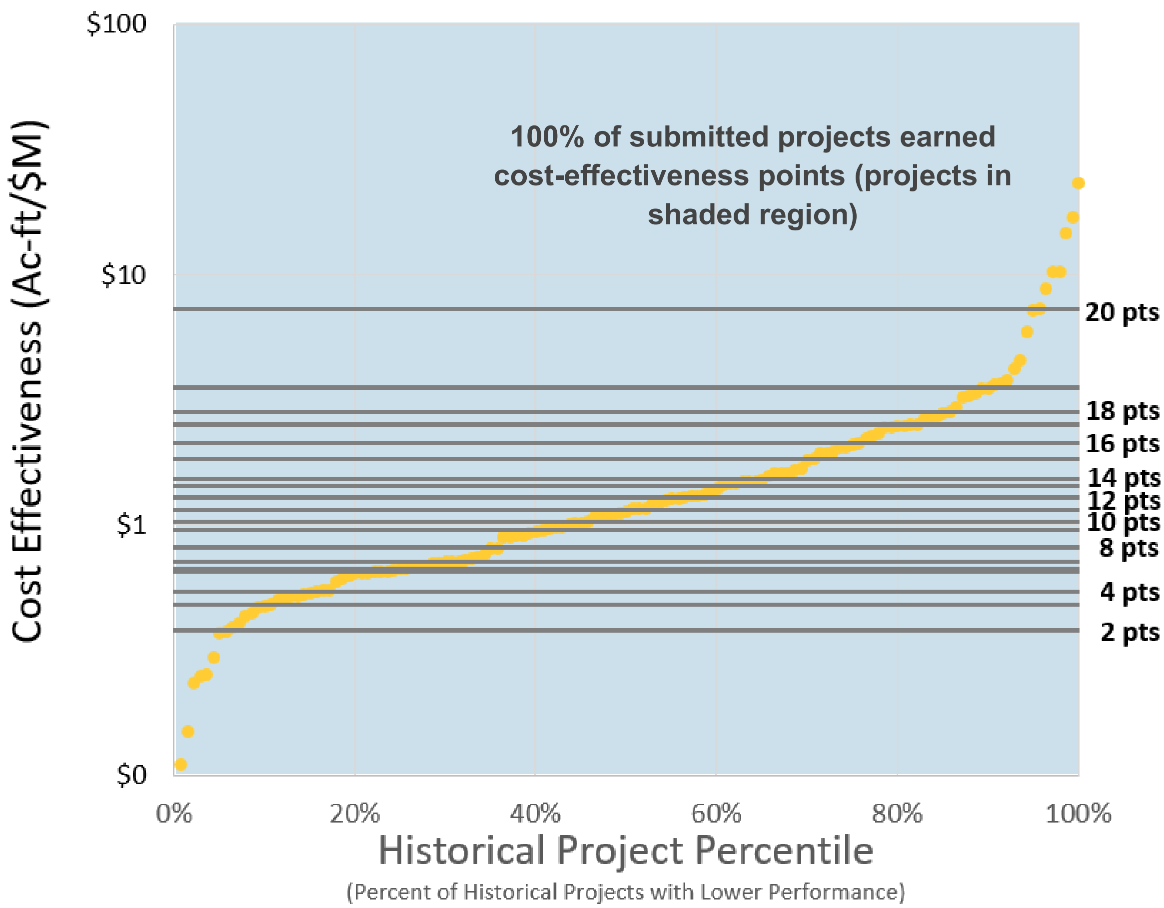

Figure 39. Distribution of Historical Project Cost-Effectiveness Compared to Scoring Criteria (note logarithmic scale)

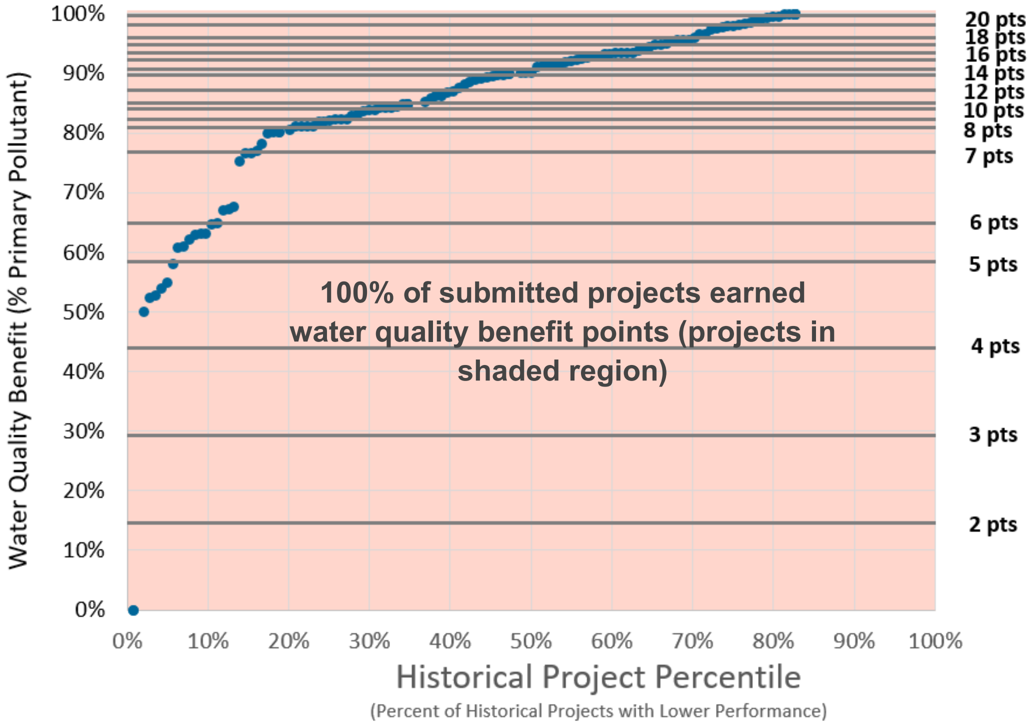

Figure 40. Distribution of Historical Wet Weather Project Water Quality Benefits for Primary Pollutants Compared to Scoring Criteria

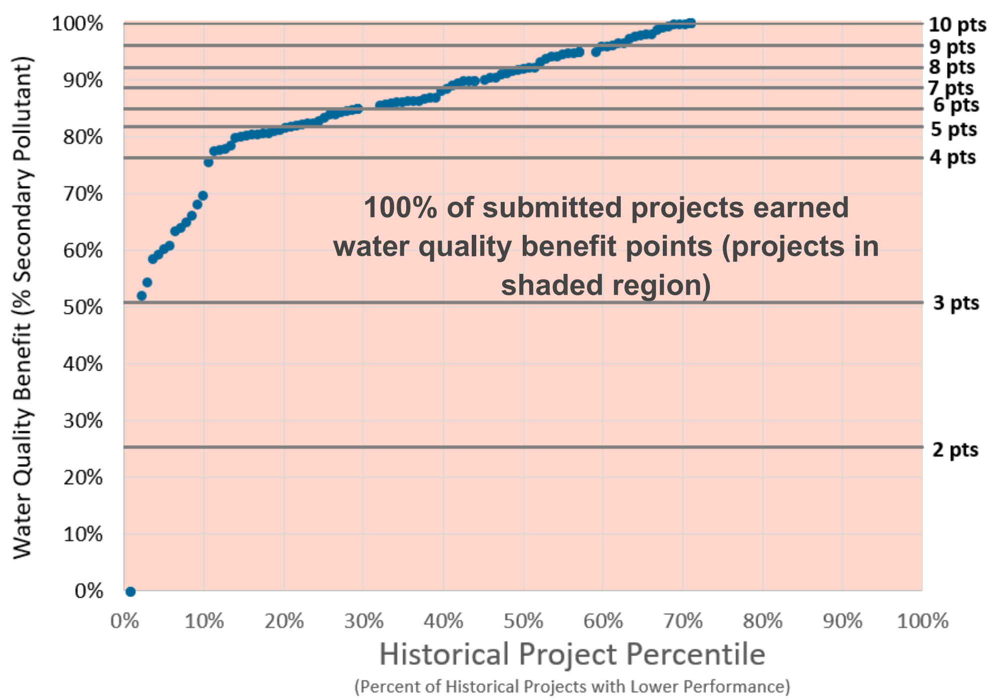

Figure 41. Distribution of Historical Wet Weather Project Water Quality Benefits for Secondary Pollutants Compared to Scoring Criteria

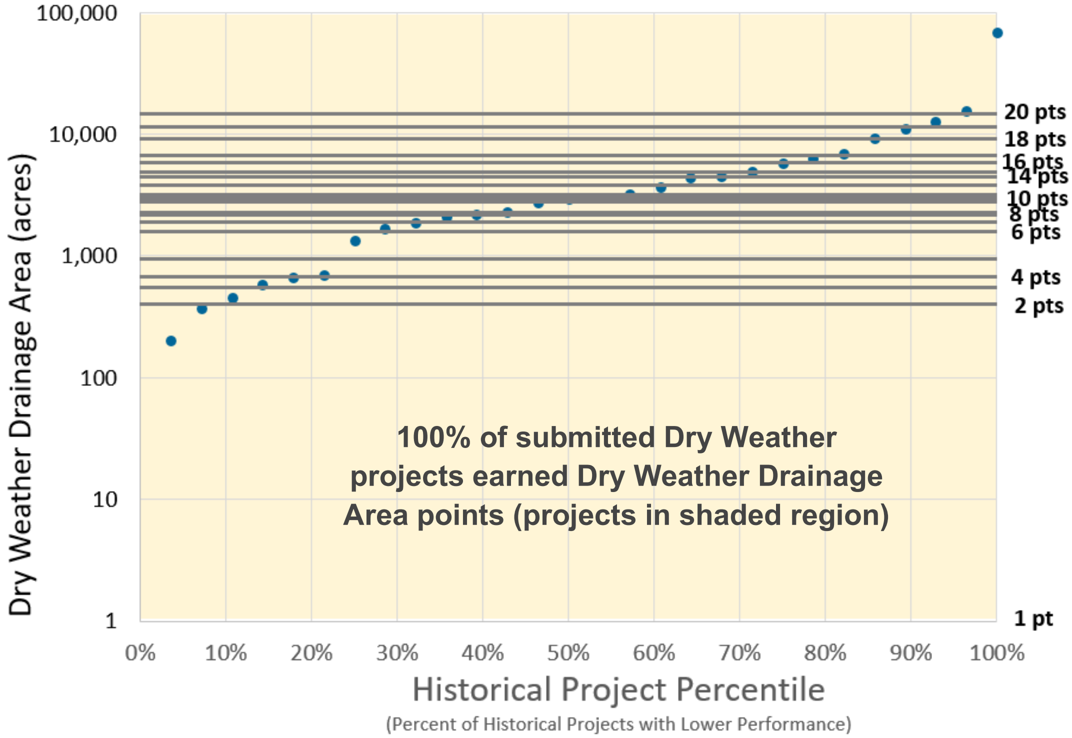

Figure 42. Distribution of historical dry weather project water quality benefits for tributary drainage area compared to scoring criteria (note logarithmic scale)

Approach 5: Creating Pollutant Mass Capture-based Scoring Rubrics

Currently, water quality benefit scores are assessed differently for wet weather projects and dry weather projects, with different maximum point awards. For wet weather projects, water quality benefit scores are awarded based on the percentage of their primary and secondary pollutants captured by the BMP. This rubric inherently does not consider the actual amount of pollutants being captured by a project. For example: a project receiving a small mass load of pollutant can easily capture 100% of that load. This means that the scoring metric does not consider the locational context of a project in the watershed, or whether it is treating areas of the watershed with high pollutant loads. Specifically, Figure 43 illustrates **that there is no observable correlation between reported zinc capture percentages and mass loads**. For this exploratory approach, points were awarded at single point increments across the full point ranges, to all wet and dry weather projects with reported Zinc load mass capture estimates. A new pollutant mass-based cost effectiveness score was created by dividing the projects' capital cost in millions of dollars by the mass of zinc captured annually. A new pollutant mass-based water quality magnitude benefit score was created using the mass of zinc captured annually. The calibrated rubric for cost-effectiveness is shown in Table 16 and Figure 44, and for magnitude in Table 17 and Figure 45.

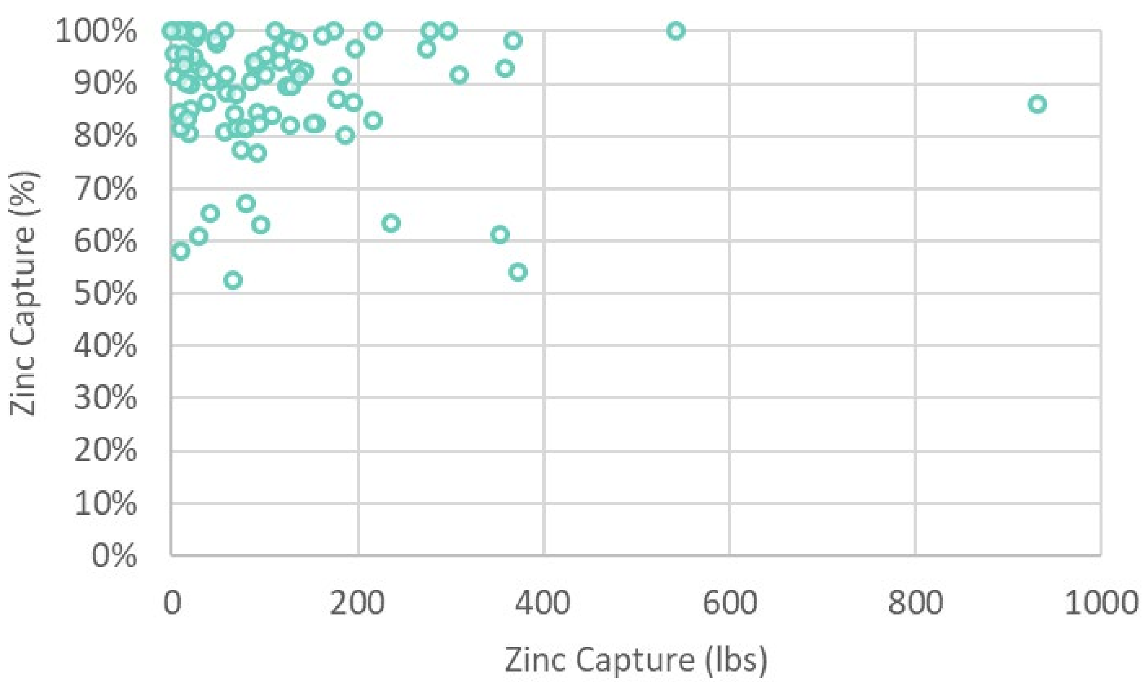

Figure 43. No correlation exists between reported zinc capture percentages and zinc capture loads

Table 16. Pollutant Mass Capture Cost Effectiveness Scoring Rubric Calibrated to Historical Project Data with Gradation, Wet and Dry Weather Projects

Pollutant Mass Cost Effectiveness = (Capital Cost in $Millions) / (lbs. Zn captured) ($M/lb.)	Points
≥$1.09	1
$1.089–$0.81	2
$0.809–$0.64	3
$0.639–$0.52	4
$0.519–$0.46	5
$0.459–$0.38	6
$0.379–$0.34	7
$0.339–$0.27	8
$0.269–$0.24	9
$0.239–$0.23	10
$0.229–$0.20	11
$0.199–$0.19	12
$0.189–$0.14	13
$0.139–$0.13	14
$0.129–$0.11	15
$0.109–$0.10	16
$0.099–$0.09	17
$0.089–$0.07	18
$0.069–$0.06	19
<$0.06	20

Table 17. Pollutant Mass Capture Water Quality Benefit (Magnitude) Scoring Rubric Calibrated to Historical Project Data with Gradation, Wet and Dry Weather Projects

Pollutant Mass Magnitude = lbs. Zn captured (lbs. Zn)	Points
<2	1
2.0–2.9	2
3.0–3.9	3
4.0–5.9	4
6.0–6.9	5
7.0–9.9	6
10.0–12.9	7
13.0–14.9	8
15.0–18.9	9
19.0–23.9	10
24.0–28.9	11
29.0–33.9	12
34.0–41.9	13
42.0–52.9	14
53.0–61.9	15
62.0–69.9	16
70.0–80.9	17
81.0–91.9	18
92.0–96.9	19
97.0–109.9	20
110.0–129.9	21
130.0–139.9	22
140.0–159.9	23
160.0–189.9	24
190.0–219.9	25
220.0–239.9	26
240.0–289.9	27
290.0–359.9	28
360.0–559.9	29
≥560	30

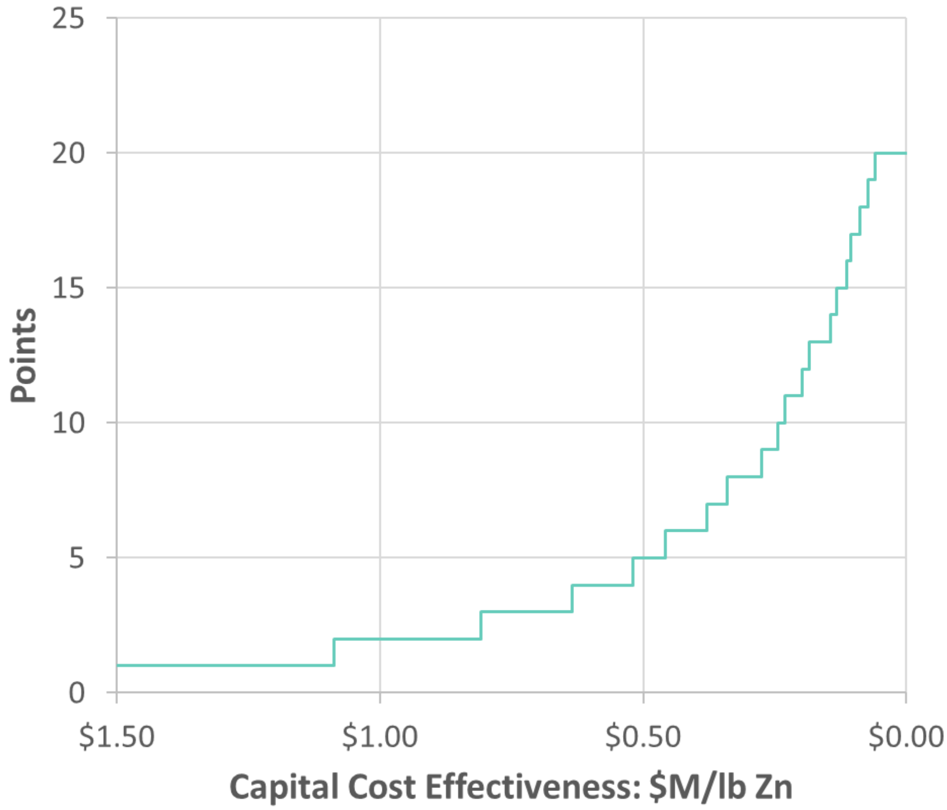

Figure 44. Pollutant Mass Capture Cost-Effectiveness Scoring Rubric Calibrated to Historical Projects with Gradation

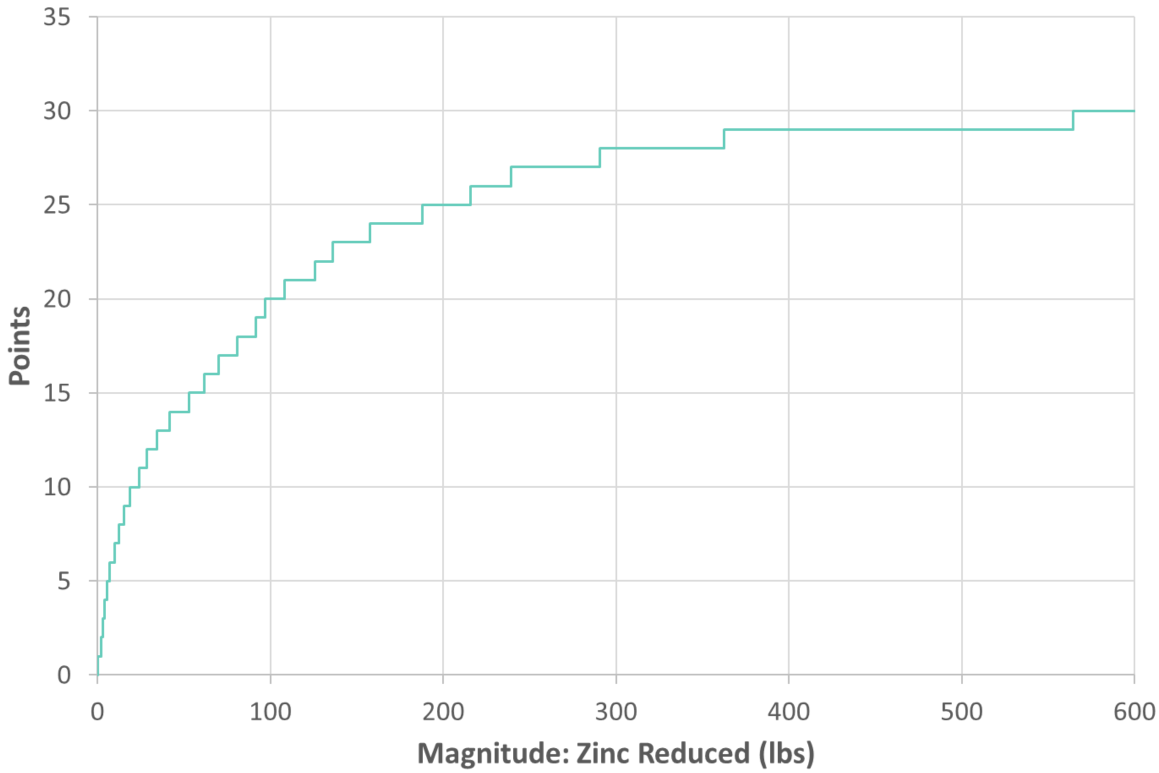

Figure 45. Pollutant Mass Capture Magnitude Scoring Rubric Calibrated to Historical Projects with Gradation

Programmatic Impact

The projects historically submitted to the Program were re-scored using the calibrated Water Quality Benefit scoring criteria above to evaluate how the alternative criteria could impact Program-wide scoring trends. Figure 46 charts average scores by Watershed Area. Figure 47 and Figure 48 show how the calibrated criteria align with the distribution of historical project performance; note that under this alternative scoring rubric, 100% of projects receive Water Quality Benefit points.

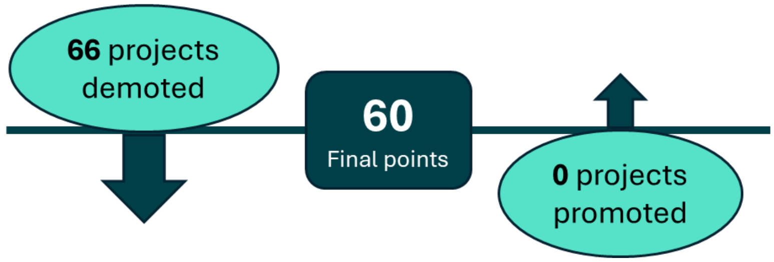

Table 18 reports statistics on the change in final project scores across all analyzed projects when the alternative criteria are applied. Note that due to missing data, the number of projects receiving a final score is less than those included to calculate single category scores. **On average, the alternative criteria could significantly decrease cost-effectiveness scores by 4.1 points and substantially decrease Water Quality Benefit/Magnitude scores by 12.6 points. The application of these calibrated score criteria may result in zero projects increasing from below to above the 60-point threshold, and 66 out of 130 projects' final scores dropping below the 60-point threshold.** Final scores could increase for 9 out of 130 projects and decrease for 119 out of 130 projects. If project developers were given the choice of the best between this alternative approach and the current metrics, it would result in final scores decreasing for none of the projects and would result in an increase of 1.3 points for cost-effectiveness and 2.1 for water quality benefit/magnitude. Pollutant load reduction in terms of mass is not inherently correlated with pollutant load reduction in terms of a percentage. This, combined with the distribution of scores under the current scoring criteria, could cause many scores to decrease. This means that use of this scoring method could potentially create an unfair disadvantage in new project applications if project developers were not given the choice between this alternative and the current rubric. **While these alternative criteria may more directly depict realized water quality benefits, it is not yet recommended (unless the weighting and/or threshold scores are also reconsidered) due to the drastic change from current criteria.**

Table 18. Change in Score Under Pollutant Mass Capture-based Criteria Calibrated to Historical Projects with Gradation

Change from Current Criteria	New Pollutant Mass Capture: Cost-Effectiveness	New Pollutant Mass Capture: Magnitude	Choice of New Pollutant Mass Capture or Current Cost-Effectiveness	Choice of New Pollutant Mass Capture or Current Water Quality Benefit
Largest Decrease	-19.0	-29.0	0	0
Mean	-3.0	-9.8	1.3	2.1
Largest Increase	17.0	10.0	17.0	30.0

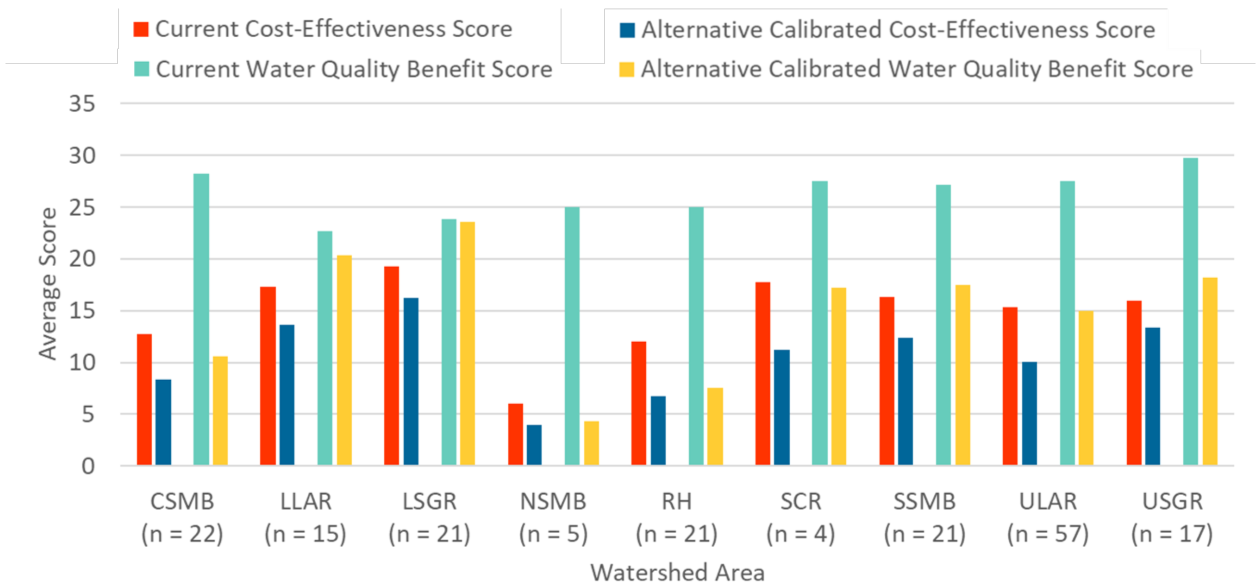

Figure 46. Average Scores Using Pollutant Mass Capture Criteria Calibrated with Historical Projects Compared to Current Criteria, by Watershed Area

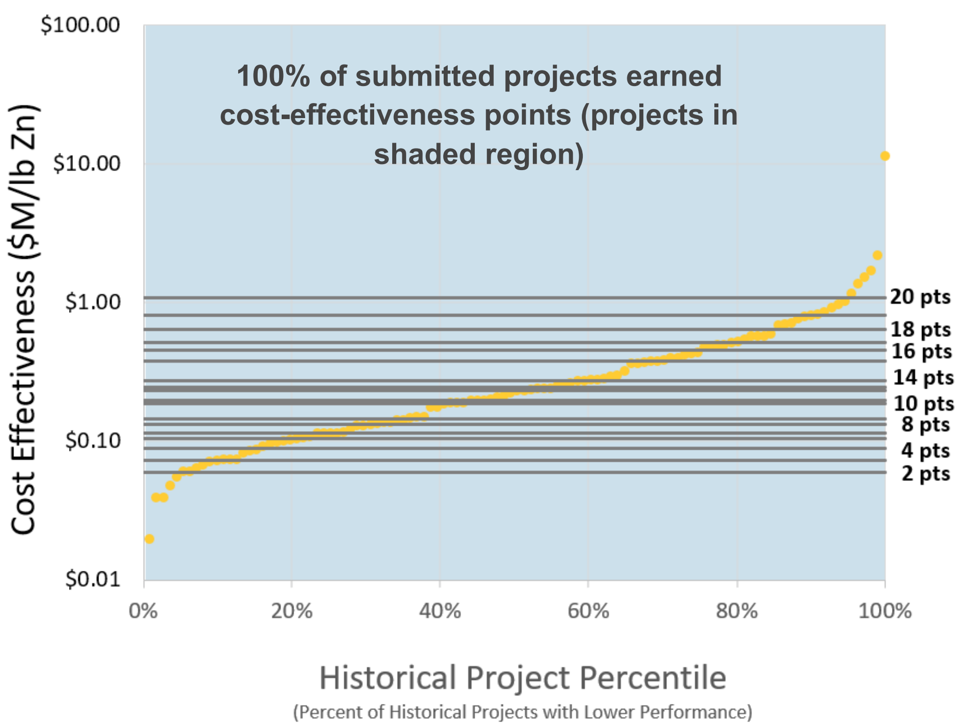

Figure 47. Distribution of Historical Project Cost-Effectiveness Compared to Scoring Criteria (note logarithmic scale)

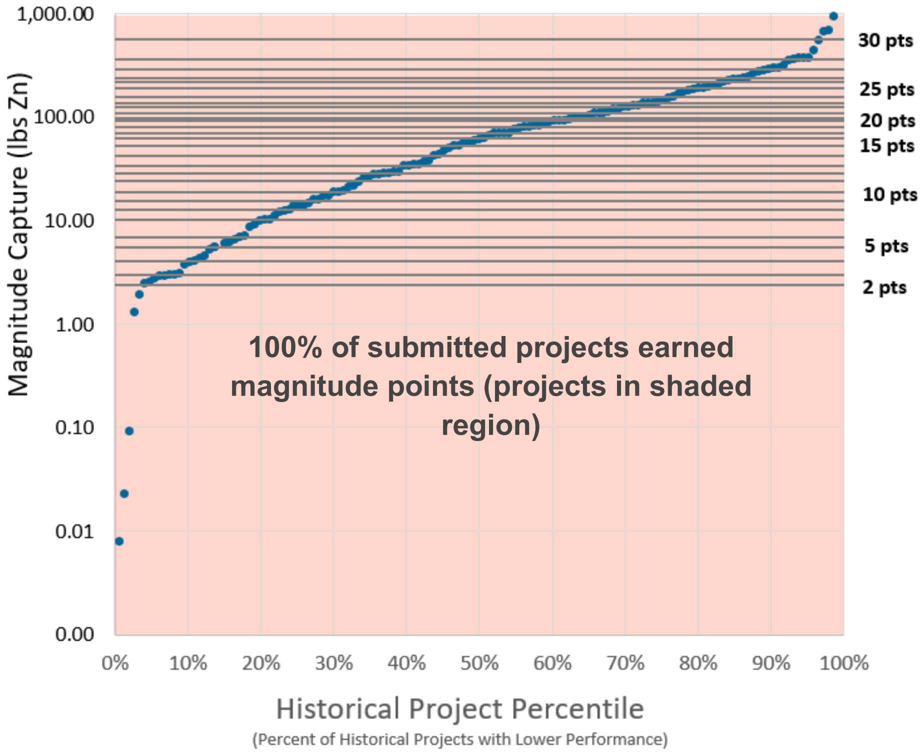

Figure 48. Distribution of Historical Project Magnitude Capture Compared to Calibrated Scoring Criteria (note logarithmic scale)

Summary of Alternative Scoring Criteria Analysis

The histograms below display the number of projects that would earn each point category under the alternative criteria. Figure 49 shows the distribution of cost-effectiveness scores and highlights how, under historically calibrated criteria, it is more challenging for submitted projects to earn points for water quality cost-effectiveness than with the currently awarded point values. While the historically calibrated rubric with gradation uniformly distributes points across the range of projects, many projects' points earned may be reduced. The current Water Quality rubrics award the maximum point values possible to 31% of the projects included in this analysis, so any sort of calibration which is aimed at equally distributing historical project scores across the maximum point ranges would result in projects earning less points.

Figure 50 shows the distribution of water quality benefit scores and highlights how the historically calibrated criteria with gradation also result in substantially less projects earning points for water quality benefits. Both the added-gradation and historically calibrated criteria are more uniformly spread but provide no score improvement. Due to the additive nature of the water quality benefit criteria, the current point rubric with added gradation does not spread point values earned by projects as evenly across the entire range, but these values have a greater spread than the current rubric without gradation.

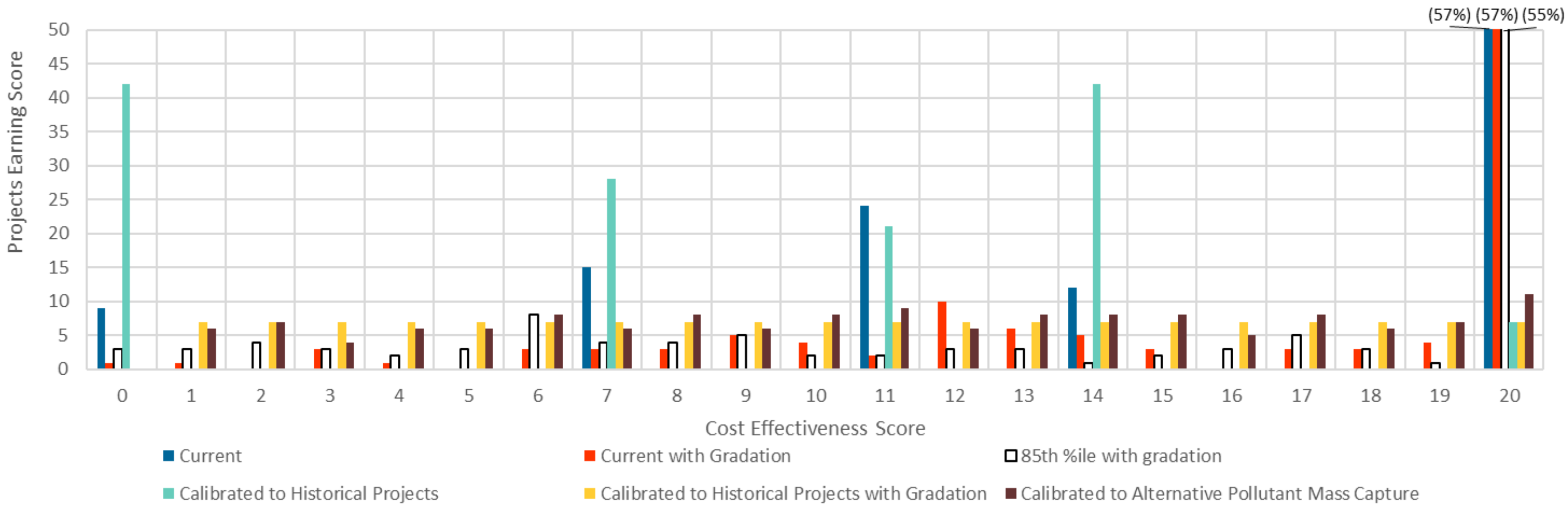

Figure 49. Histogram of Cost-Effectiveness Scores Under Each Scoring Rubric

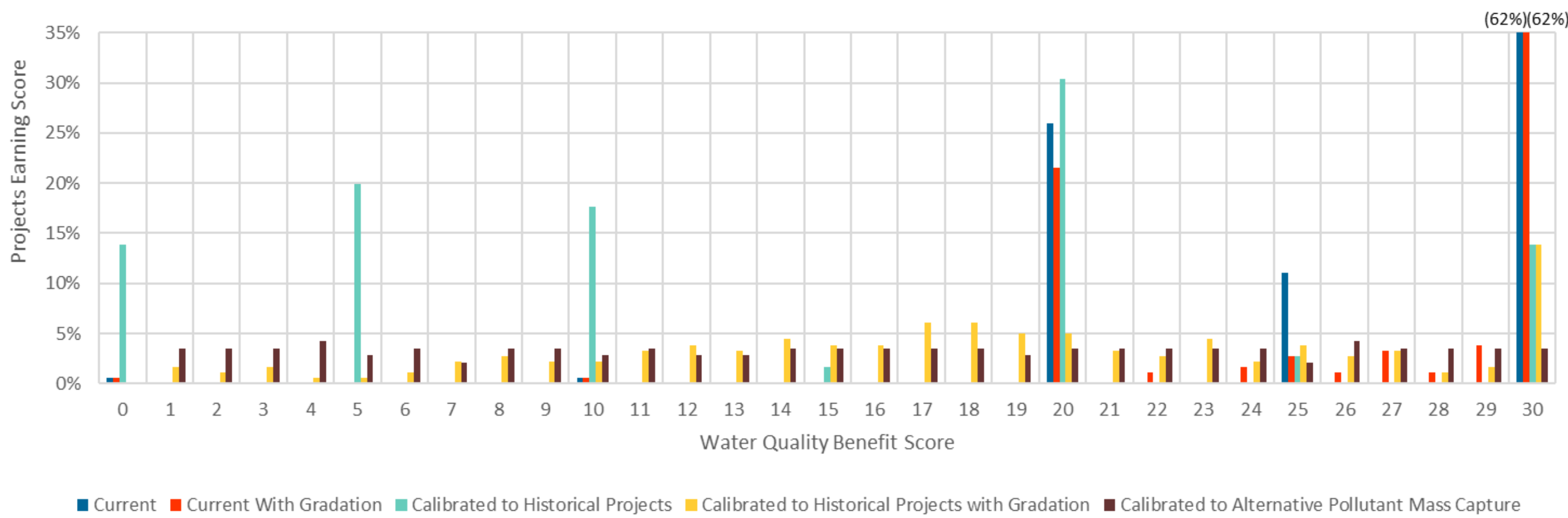

Figure 50. Histogram of Capture Magnitude Scores Under Each Scoring Rubric

Recommendation

Public Works should consider implementing the current Water Quality Benefit scoring criteria modified to award incremental point values between those it currently awards. This gradation allows project scores to be tallied at one-point increments (as compared to the current stepwise criteria) and enables projects managing smaller drainage areas to earn points. **Additionally, Public Works should consider adding an optional approach for project developers to calculate cost-effectiveness scores based on the 85th percentile storm runoff capture volume rather than the project's 24-hour capacity.** Once proposed adaptations are made to the Projects Module, information such as a project's diversion and storage capabilities will allow the estimation of the actual amount of runoff captured by a project during an 85th percentile design storm. Providing this option introduces a more realistic expectation of a project's performance relative to water quality. Making an adjustment from current scoring rubrics based on historical projects would result in significant challenges for projects to attain desirable score thresholds. And, while an alternative rubric scaled to the magnitude of pollutant capture (e.g., pounds of Zinc) would better represent the actual magnitude of Water Quality Benefits, this approach would also make the criteria more stringent and essentially disqualify a substantial number of historical projects. Appling more stringent scoring criteria could be perceived as an unfair disadvantage on future project applications unless the category weighting and/or threshold score are also adjusted.

Due to the low project count in some Watershed Areas, the team does not recommend developing Watershed-Area-specific rubrics at this time. Additionally, to continue to encourage cost-effective and highly impactful projects, and to minimize complexity in the scoring process, the team does not recommend developing scoring criteria that are customized to different project sizes barring proposed updates to the project module that may be used to automatically designate projects between "Wet" and "Dry" designations automatically based on module-generated 85th percentile storm runoff capture information.

Appendix A: Recommended Water Quality Scoring Updates

Exhibit A – Infrastructure Program Project Scoring Criteria

Section	Score Range	Scoring Standards
A.1 Wet + Dry Weather Water Quality Benefits	50 points max	The Project provides water quality benefits
	20 points max	A.1.1 : For Wet Weather BMPs Only: Water Quality Cost Effectiveness (Cost Effectiveness) = (24-hour BMP Capacity)[1] / (Capital Cost in $Millions) • < 0.12 = 0 points • 0.12–0.169 = 1 point • 0.17–0.219 = 2 points • 0.22–0.259 = 3 points • 0.26–0.309 = 4 points • 0.31–0.349 = 5 points • 0.35–0.399 = 6 points • 0.40–0.449 = 7 points • 0.45–0.489 = 8 points • 0.49–0.539 = 9 points • 0.54–0.579 = 10 points • 0.58–0.629 = 11 points • 0.63–0.679 = 12 points • 0.68–0.719 = 13 points • 0.72–0.769 = 14 points • 0.77–0.819 = 15 points • 0.82–0.859 = 16 points • 0.86–0.909 = 17 points • 0.91–0.949 = 18 points • 0.95–0.999 = 19 points • ≥ 1.000 = 20 points *(20 Points Max)* *[1]. Management of the 24-hour event is considered the maximum volume managed by a Project during a 24-hour, 85th percentile design storm event. Units are in acre-feet (AF).*

<table>
<tr><td>- OR -</td><td>30 points max</td><td>A.1.2: For Wet Weather BMPs Only: Water Quality Benefit - Quantify the pollutant reduction (i.e. concentration, load, exceedance day, etc.) for a class of pollutants using a similar analysis as the E/WMP which uses the Districts Watershed Management Modeling System (WMMS). The analysis should be an average percent reduction comparing influent and effluent for the class of pollutant over a ten-year period showing the impact of the Project. Modeling should include the latest performance data to reflect the efficiency of the BMP type.

Primary Class of Pollutants
• < 3.0% = 0 points
• 3.1–6.9% = 1 point
• 7.0–9.9% = 2 points
• 10.0–12.9% = 3 points
• 13.0–16.9% = 4 point
• 17.0–19.9% = 5 points
• 20.0–22.9% = 6 points
• 23.0–26.9% = 7 points
• 27.0–29.9% = 8 points
• 30.0–32.9% = 9 points
• 33.0–36.9% = 10 points
• 37.0–39.9% = 11 points
• 40.0–42.9% = 12 points
• 43.0–46.9% = 13 points
• 47.0–49.9% = 14 points
• 50.0–55.9% = 15 points
• 56.0–61.9% = 16 points
• 62.0–67.9% = 17 points
• 68.0–73.9% = 18 points
• 74.0–79.9% = 19 points
• ≥ 80.0% = 20 points
(20 Points Max)

Second or More Classes of Pollutant
• < 10.0% = 0 points
• 10.0–19.9% = 1 point
• 20.0–29.9% = 2 points
• 30.0–39.9% = 3 points
• 40.0–49.9% = 4 points
• 50.0–55.9% = 5 points
• 56.0–61.9% = 6 points
• 62.0–67.9% = 7 points
• 68.0–73.9% = 8 points
• 74.0–79.9% = 9 points
• ≥ 80.0% = 10 points
(10 Points Max)</td></tr>
<tr><td rowspan="2">A.2
Dry Weather Only
Water Quality Benefits</td><td>20 points</td><td>A.2.1: For dry weather BMPs only, Projects must be designed to capture, infiltrate, treat and release, or divert 100% (unless infeasible or prohibited for habitat, etc) of all tributary dry weather flows.</td></tr>
<tr><td>20 points max</td><td>A.2.2: For Dry Weather BMPs Only. Tributary Size of the Dry Weather BMP
• < 20.0 Acres = 10 points
• 20.0–39.9 Acres = 11 points
• 40.0–59.9 Acres = 12 points
• 60.0–79.9 Acres = 13 points
• 80.0–99.9 Acres = 14 points
• 100.0–119.9 Acres = 15 points
• 120.0–139.9 Acres = 16 points
• 140.0–159.9 Acres = 17 points
• 160.0–179.9 Acres = 18 points
• 180.0–199.9 Acres = 19 points
• ≥ 200.0 Acres = 20 points
(20 Points Max)</td></tr>
</table>