

LTEA Methodology (Condensed)

Data sets used in this review included:

- Stormwater Mass Loading Monitoring (MLS) – Wet Weather Data
- Copermittee Dry Weather Data Monitoring
- Ambient Bay, Lagoon, and Coastal Receiving Water Monitoring (ABLM)
- Urban Stream Bioassessment Monitoring
- Triad Assessment – Toxicity Testing of Stormwater
- 303d Listing

Coastal storm drain outfall monitoring was not included in this review, because the outfalls are not monitored for specific sub-watersheds, but rather they are monitored for small, specific catchments associated with the corresponding outfall pipe.

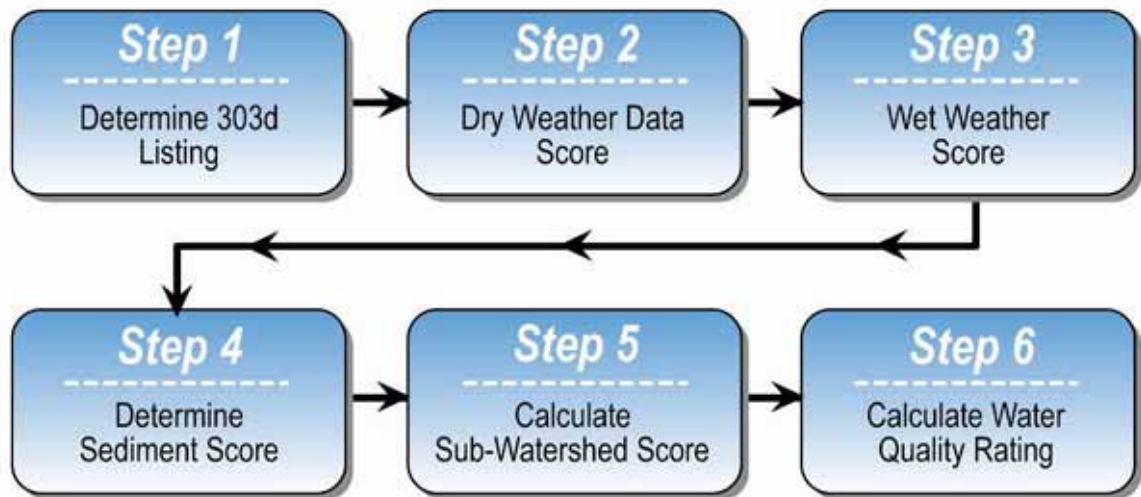


Figure 2-3. Water Quality Priority Rating Methodology

Step 1 303d List

Step 1: 303d Rating	Area	Stressor Group - Benthic Alterations or Toxicity					Cum. Score
		303d	Dry Weather	Wet Weather	Sediment	Score	
Sub-watershed 1	75%	N					
Sub-watershed 2	25%	Y				3.0	
MLS Results							
ABLM Results							
Rating							
Priority Level							

Step 2 Dry Weather Data

The percent exceedance cutoffs chosen for this analysis are consistent (similar but different) with the percentages used in the San Diego County Urban Runoff Monitoring Program.

Step 2: Dry Weather Score	Area	Constituent Group-Metals				
		303d	Dry Weather	Wet Weather	Sediment	Score
Sub-watershed 1	75%	N	2			
Sub-watershed 2	25%	Y	0			3
MLS Results						
ABLM Results						
Rating						
Priority Level						

Table 2-1. Summary of Water Quality Exceedance Scale

Score	Exceedance Scale	Minimum Number of Data Points Needed	Alternative Score if Minimum Data Requirements Not Met
3	Exceedance > 50%	3	2
2	25%<Exceedance<50%	3	1
1	10%<Exceedance<25%	3	0
0	Exceedance < 10%	3	0
Blank	No Data	0	N/A

Step 3 Wet Weather Score

For the data set, each WMA was first assigned a 0, 1, 2, or 3 score based on the wet weather MLS data, using the same rating scale described above for dry weather data (See Table 2-1). The MLS score was then used to assign a 0, 1, 2, or 3 to each of the sub-watersheds based on the following criteria:

- If the WMA MLS score was 0, then each sub-watershed was also scored as 0
- If the WMA MLS score was 1, then each sub-watershed was also scored as 1
- If the WMA MLS score was 2, then each sub-watershed was also scored as 2
- If the WMA MLS score was 3, then all of the sub-watersheds MLS scores were assigned a score of 2, except for the sub-watershed where the MLS data is collected, which is given a score of 3. In this case, the sub-watersheds were scored 2 instead of 3 since there is no actual wet weather data collected on a sub-watershed basis to warrant a rating of 3.

Step 3: MLS Data Score	Area	Constituent Stressor Group-Metals				
		303d	Dry Weather	Wet Weather	Sediment	Score
<i>Sub-watershed 1 -MLS located in this sub-watershed</i>	75%	N	2	3		
<i>Sub-watershed 2</i>	25%	Y	0	2		3
<i>MLS Results</i>		3				
<i>ABLM Results</i>						
Rating						
Priority Level						

There are a few exceptions to the methodology described above. Some of the WMAs group together a number of watersheds (Carlsbad, San Diego Bay). The MLS data collected at the downstream end of one watershed doesn't necessarily reflect conditions in an adjacent watershed. In those instances where there is no MLS station anywhere downstream of a sub-watershed, the corresponding sub-watershed cells were left blank.

Step 4 Sediment Score

The rating for sediment utilizes the ABLM results and projects these scores to the sub-watershed up-stream of where the sediment has been evaluated. Sediment quality in the lagoons is therefore used to develop the constituent priorities for the sub-watershed because impacted sediments are transported from throughout the watershed to the estuaries. As more sub-watershed specific sediment data is available, the score can be modified to reflect these data.

ABLM results were compared against established effects range low (ERL) concentrations and effects range medium (ERM) concentrations. The ERL represents the concentration below which adverse biological effects are rarely observed, and the ERM represents the concentration above which adverse biological effects are more frequently observed.

Table 2-2. Summary of Sediment Scoring Criteria

Score	Scoring Criteria For Sediment
3	Concentration > ERM
2	ERL<Concentration< ERM
1	Data Inconclusive
0	Concentration < ERL

Step 4: ABLM Score	Area	Constituent Group-Metals				
		303d	Dry Weather	Wet Weather	Sediment	Score
Sub-watershed 1	75%	N	2	3	1	
Sub-watershed 2	25%	Y	0	2	1	3
MLS Results		3				
ABLM Results		1				
Rating						
Priority Level						

Similar to what was described for the MLS data, there are a few exceptions to the methodology described above. In particular, the Carlsbad WMA constitutes a group of watersheds. The ABLM data collected in an embayment of one watershed doesn't necessarily reflect conditions in an adjacent watershed. In those instances where there was no ABLM performed or a certain constituent wasn't monitored for, the cell was left blank.

Step 5 Sub-Watershed Scoring

Once all of the data sets were scored, a total constituent group score for each constituent group and each sub-watershed was calculated. This score is a value from 0 to 3 and was calculated using the following method:

- If there was a Y (yes) for the 303d listing, then that sub-watershed automatically received a score of 3 for that constituent, over-riding the scores for the dry weather, wet weather, and sediment data as discussed under Step 1.
- If there was an N (no) for the 303d listing, then the sub-watershed score was calculated by taking the average of the dry weather, wet weather, and sediment data sets.

Step 5: Sub-watershed Score	Area	Constituent Group - Metals				
		303d	Dry Weather	Wet Weather	Sediment	Score
Sub-watershed 1	75%	N	2	3	1	2
Sub-watershed 2	25%	Y	0	2	1	3
MLS Results		3				
ABLM Results		1				
Rating						
Priority Level						

Step 6 Water Quality Priority Rating

The final step in this process was to determine the Water Quality Priority Rating for each constituent group within a WMA. In order to account for greater loading from larger sub-watersheds compared to smaller one, the Priority Rating was calculated by using an area weighted average of the scores from each of the sub-watersheds. This approach is different from the sub-watershed score which used the average of the 303d, dry weather, wet weather and sediment scores. The following equation illustrates this procedure:

$$\text{Priority Rating} = \% \text{ Area 1} * \text{Sub-watershed 1 Score} + \% \text{ Area 2} * \text{Sub-watershed 2 Score}$$

The resulting ratings were used to assign the Water Quality Priority Rating or Level of each constituent/stressor group using the following scale:

- Priority Level A = Rating 2.25 – 3.00 – Highest Priority Rating
- Priority Level B = Rating 1.50 – 2.24
- Priority Level C = Rating 0.75 – 1.49
- Priority Level D = Rating 0.00 – 0.74 – Lowest Priority Rating

Step 6: Priority Rating	Area	Constituent Group - Metals				
		303d	Dry Weather	Wet Weather	Sediment	Score
Sub-watershed 1	75%	N	2	3	1	2
Sub-watershed 2	25%	Y	0	2	1	3
MLS Results		3				
ABLM Results		1				
Rating		0.75*2 + 0.25*3 = 2.25				
Priority Level		A				

The exceptions to this procedure included Carlsbad WMA and San Diego Bay WMA in which no data existed for several sub-watersheds, and therefore no score was determined for these sub-watersheds. For these cases, the watershed priority rating was based on the weighted average using the total areas of only these sub-watersheds for which a score was determined. The percent of total area used in the weighted average was therefore based on the total area of the rated sub-watersheds for which data was available, instead of using the total area of the WMA. The other exceptions included Tijuana and Santa Margarita WMA. The total area used in the weighted average was based on the areas of the sub-watersheds within the County instead of the total area of the WMA.

Table -1. 2001–2006 San Luis Rey River Watershed Area Water Quality Priority Ratings

Watersheds/Subwatersheds	Percentage of Total Area	Priority Ratings*											
		Constituent Groups										Stressor Groups	
		Heavy Metals	Dissolved Minerals	Organics	Oil and Grease	Sediments	Pesticides	Nutrients	Gross Pollutants	Bacteria/Pathogens	Benthic Alterations	Toxicity	
San Luis Rey WMA	100%	D	B	D	D	C	D	C	D	B	B	C	
Lower San Luis HA (903.10)	33%	D	A	D	D	C	C	A	D	A	A	C	
Monserate HA (903.20)	30%	C	C	D	D	C	D	C	C	C	B	C	
Warner Valley HA (903.30)	37%	D	C	D	D	D	D	D	D	B	B	C	
2006–2007 High ¹ Frequency of Occurrence Ratings and COC			◆◆◆ TDS							◆◆◆ Fecal coliform	Very Poor IBI		
2007–2008 High ¹ Frequency of Occurrence Ratings and COC			◆◆◆ TDS							◆◆◆ Fecal coliform			

1. High frequency of occurrence ratings are derived from the constituent exceedances tables and are provided for comparison purposes.

Notes:

* = Rating Calculated Based on Area Weighted Averages of Score Value from the subwatershed areas.

** = Priority Level (Highest (A) to Lowest (D))

High-Priority Level Based on Data

303d listing

LTEA Assessment Methodology (Pros and Cons)

Overall Purpose

- Provides long term (5 yr) assessment of the watershed to guide watershed management activities.
- Permit requirement and provides basis for ROWD.

LTEA Assessment Method Pros and Cons	
Pros	Cons
Uses a defined methodology that is used to assess watershed priorities	Not specific to a constituent (uses parameter groups)
Uses a triad based assessment	Projected MLS results into sub-watersheds related to drainage area.
Provided results on a sub-watershed area	Attempted to be too inclusive of all data sets (tries to combine all data, e.g. ABLM, and 303 d listing)
Provides an overall watershed score	Lacks specificity for incorporating new data sets
Provided information on where data was lacking	Projects sediment score into subwatersheds (marine standards are not comparable to freshwater standards, different target organisms and effects)
Assessed program data separately	Sediment assessment are not done in subwatersheds nor are planned (other than pyrethroids)
Uses letters for Priority Ratings (A is highest priority)	Outdated-SQOs replace ERM comparison
	Overall score applied to entire watershed and inferred watershed wide problems (which may or may not be the case)
	Weighted sub-watershed based on area
	Did not consider percent of urbanized area.
	Uses letters for Priority Ratings (A is highest priority) as opposed to high, medium, or low
	MLS and TWAS may be in same HA. Needs to be scalable and adjustable to drainage area level
	Does not break out MS4 from Receiving Water condition
	Does not consider trends as a factor influencing rating

Recommendations

- blend useful items from LTEA and WMA Assessments
- Modify structure of assessment for receiving water only (wet and dry)
- Screen WMA for % urbanization for focus on urban runoff programs (in urban areas)
- Provide a sub-watershed version for prioritization of focus areas (scalable)
- drop items that skew results (e.g. weighting from unrelated areas, 303(d),etc...)
- results based on data alone (but present areas where 303(d) listings or TMDLs occur