

**REVISED MANAGEMENT AND MONITORING QUESTIONS FOR SANTA MARGARITA RIVER AND ESTUARY**  
**7-16-2012 Version**

**Table 1. List of priority management questions, the monitoring or modeling question that would be addressed, and the approach for Santa Margarita River tributaries and Estuary.**

Management Question	Monitoring/Modeling Question	Approach
<b>Core Questions</b>		
Are the beneficial uses of SMR tributaries being impacted by nutrients during wet, winter dry and summer dry weather?	1. Are the baseline concentrations of algae and dissolved oxygen in listed and suspected impaired reaches and tributaries of the SMR during winter and summer dry weather exceeding NNE numeric thresholds?	Collect new data in listed and unlisted reaches during winter and summer dry.
	2. Are concentrations of nitrate and ammonia during wet weather causing toxicity in the River?	Already covered under existing policy. No further work proposed.
	3. Are BOD concentrations in wet weather causing low dissolved oxygen in the River?	
Are the beneficial uses of SMR estuary being impacted by nutrients during wet, winter dry and summer dry weather?	4. Are the baseline concentrations of nutrients, algae and dissolved oxygen in the estuary during winter and summer dry weather out of compliance with NNE numeric thresholds or basin plan objectives?	Data collected and determined that Estuary out of compliance (McLaughlin et al. 2011).
	5. Are concentrations of nitrate and ammonia in wet weather discharge causing toxicity in the Estuary?	Already covered under existing policy. No further work proposed.
	6. Are BOD concentrations in wet weather causing low dissolved oxygen in the Estuary?	
Are nearshore beneficial uses being impacted by SMR nutrient loads?	7. Are wet and/or dry weather loads from the SMR watershed causing harmful algal blooms in the northern San Diego nearshore ocean waters.?	Recently completed Bight 08 Offshore Water Quality Study addressed this question through: 1) 12 years of remote sensing analysis of blooms; and 2) source comparison
	8. What is the relative magnitude of SMR watershed loads relative to effluent and upwelling (natural) sources to northern San Diego nearshore ocean waters.	
What are appropriate water quality targets in reaches of the SMR and tributaries and estuary during wet	9. What indicators and thresholds will be protective of river beneficial uses during winter and summer dry weather?	Use new monitoring data conducted to support R1 to develop and validate in-stream hydrodynamic and water quality model. Use model to determine site-specific seasonal dry weather objectives.

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and dry weather where impairment is confirmed?	10. What indicators and thresholds will be protective of estuarine beneficial uses (defined by algal biomass and DO NNE) during winter and summer dry weather?	Use existing data to develop/calibrate estuary hydrodynamic and water quality model to determine site-specific seasonal dry weather numeric targets.
What are the appropriate load allocations and waste load allocations for wet and dry weather loading for the Santa Margarita River tributaries and other sources?	11. What is the summer and winter dry weather TMDL of N and P required to protect riverine beneficial uses for each tributary where impairment has been confirmed?	Use river water quality model to estimate based on numeric targets (to be determined).
	12. What is the summer and winter dry weather TMDL of N and P required to protect estuarine beneficial uses?	Use estuary water quality model to estimate based on numeric targets (to be determined).
	13. What is the wet weather TMDL of particulate (sediment bound) N and P required to protect estuarine beneficial uses?	Use water quality model to estimate nutrient contribution derived from particulate nutrients (via benthic flux).
	14. What is the surface water wet weather nutrient and sediment loading from Santa Margarita River tributaries and how does this loading partition by categories of interest (e.g. land use, jurisdiction) to the stakeholders?	No new data collection recommended at this time. Compile existing land use data runoff across the region; develop and validate watershed loading model (Tetra Tech funded).
	15. What is the surface water dry weather nutrient loading from reaches of the Santa Margarita River and tributaries and how does this loading partition by categories of interest (e.g. land use, jurisdiction) to the stakeholders?	New data collection conducted to support M1 (see above). May want to collect additional data on land use specific runoff/source tracking, depending on categories of interest
	16. What does the net groundwater exchange at top of gorge and in lower river contribute to nutrient loading to the River and Estuary?	Groundwater models exist (Rancho Calif. WD and Camp Pendleton). May need resources to work with modelers to get output under a range of conditions.
<b>Special Studies Questions</b>		
Are dry weather NNE thresholds appropriate for the reaches of the SMR and tributaries?	SS1. What is the exceedance frequency of algal biomass, dissolved oxygen and nutrient concentrations relative to nutrient WQOs in reference streams?	Existing study, funded by OC and SD County, city of San Diego. Dissolved oxygen not currently being monitored, but could be added
	SS2 What is the relationship between algal biomass and benthic macroinvertebrates in Southern California?	Existing study, funded by EPA ORD

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Additional river special studies	SS3. Are the baseline concentrations of algae and dissolved oxygen in unlisted reaches of the SMR during winter and summer dry weather exceeding NNE numeric thresholds?	
Estuary special studies	TBD	

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Table 2. Parking Lot for implementation Questions.

Management Question	Technical question	Approach/Comments
What are appropriate nutrient and water resource management options, given seasonal objectives in SMR tributaries?	11. Can recycled water (via groundwater or surface water) be used to augment river flow and improve water quality within the river and estuary?	Use models to run scenario analysis to evaluate a variety of flow, nutrient and BOD concentrations.
	What does the sediment (and particulate N and P) wet weather load to the estuary look like under natural conditions?	Use watershed loading model to evaluate