
Technical Concerns with the Inclusion of Bacteria TMDL into the San Diego Region MS4 Permit

Todd Snyder, County of San Diego

Ken Susilo, PE, D.WRE, CPSWQ, Geosyntec Consultants

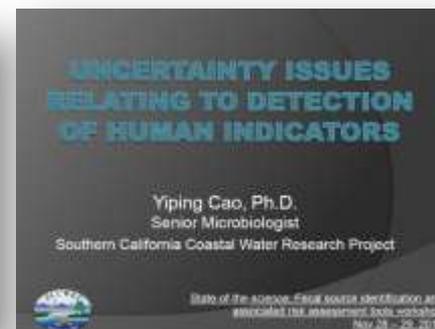


Technical Concerns with Inclusion of Bacterial TMDL for Beaches and Creeks

- **Science:** TMDL's bacteria limits do not reflect the current state of the science or recently collected data.
- **Attainability:** TMDL requirements are not consistently attainable.
- **Benefit-Cost:** No benefit-cost analysis has been performed.
- **County technical concerns were not adequately addressed in response to comments.**

Science

- Basis for Opinions
 - Review of Staff Reports
 - Review of Data in Reference Watersheds
 - Research by Nationally Recognized Experts
 - State of the Science Workshop (2012)



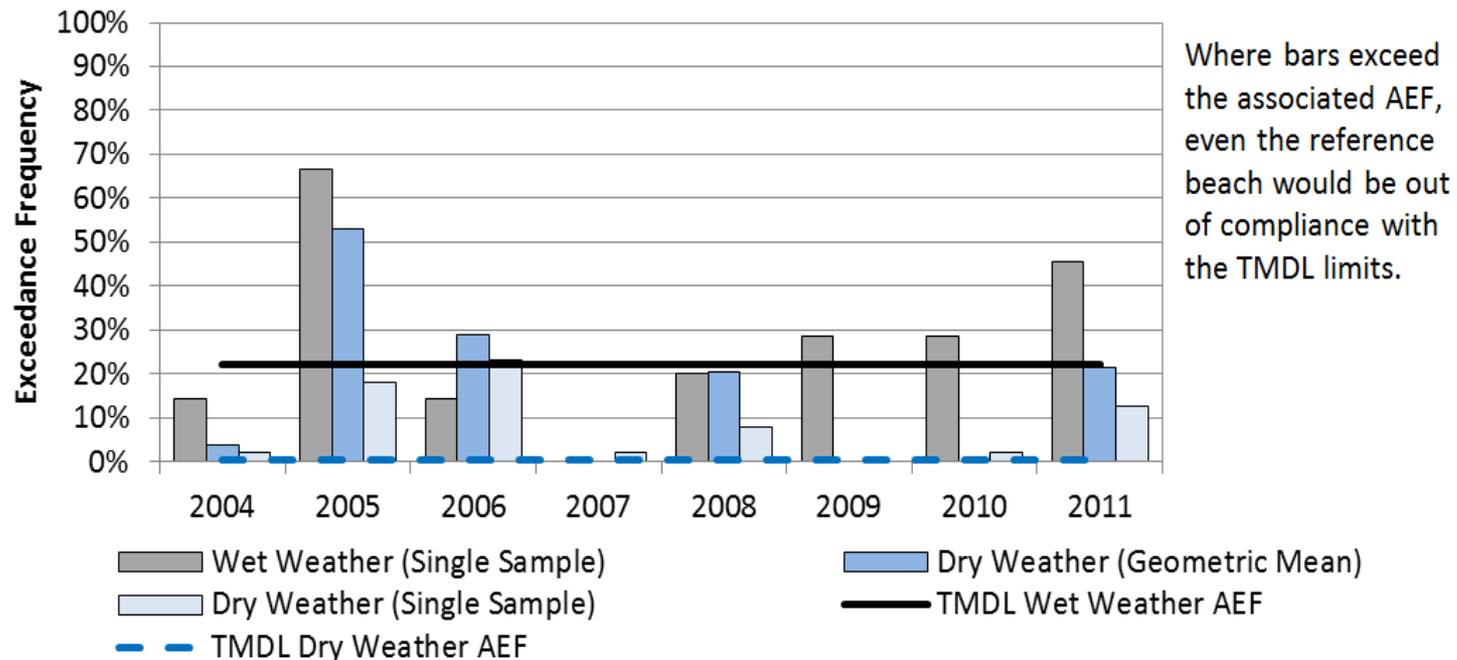
Science (Reference Approach)

- Permit Reference Approach is Inappropriately Applied to TMDL Compliance Sites
 - Large reference watersheds have higher AEF than medium size watersheds (Arroyo Sequit)
 - Wet weather AEFs should be higher (28%-30%)
 - Dry weather AEF should not be zero (winter-dry and perhaps summer-dry based on Arroyo Sequit)
 - Definition of wet weather day = 0.2 in. with 72 hr antecedent period:
 - Is inconsistent with that used for reference watershed and unsupported;
 - Makes zero dry-weather exceedances even more unreasonable.



Science (Reference Approach)

- Reference Watershed Exceeds Wet Weather TMDL Standard about 50% of the Wet Time (Dry over 85%)



Notes:

- 30-day Rolling GM - Geometric mean calculation performed every week, on the dry weather samples within the previous 30-days period, if 5 or more samples have been taken in the 30-day period.

Science (Public Health)

- TMDL does not adequately reflect a protection of public health
 - TMDL FIB limits are inconsistent with recently published EPA 2012 REC Criteria
 - Need epidemiological data to specifically quantify the illness burden for swimmers and surfers during wet weather in stormwater dominated receiving waters.



Attainability

- Basis for Opinion on Attainability
 - Actual Monitored
 - Land Use Specific Data
 - BMP Performance Data
 - In-Stream Data
 - Predicted Performance of Non-Structural BMPs
 - Structural BMP Prioritization and Analysis Tool (SBPAT) Model runs that utilized actual land use and BMP performance data

SBPAT

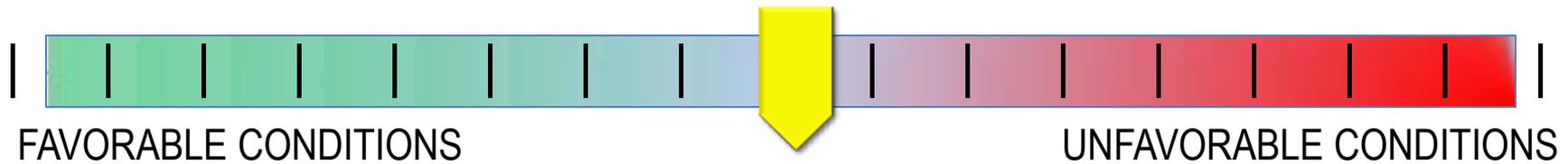
- From the Los Angeles MS4 Permit
*A Reasonable Assurance Analysis (RAA) shall be quantitative and performed using a peer-reviewed model in the public domain. Models to be considered for the RAA [include]... **Structural BMP Prioritization and Analysis Tool (SBPAT).***
- Incorporates land use EMC data, BMP effluent data, SWMM modeling, and deterministic and stochastic analyses.

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Attainability (Uncertainty and Variability)

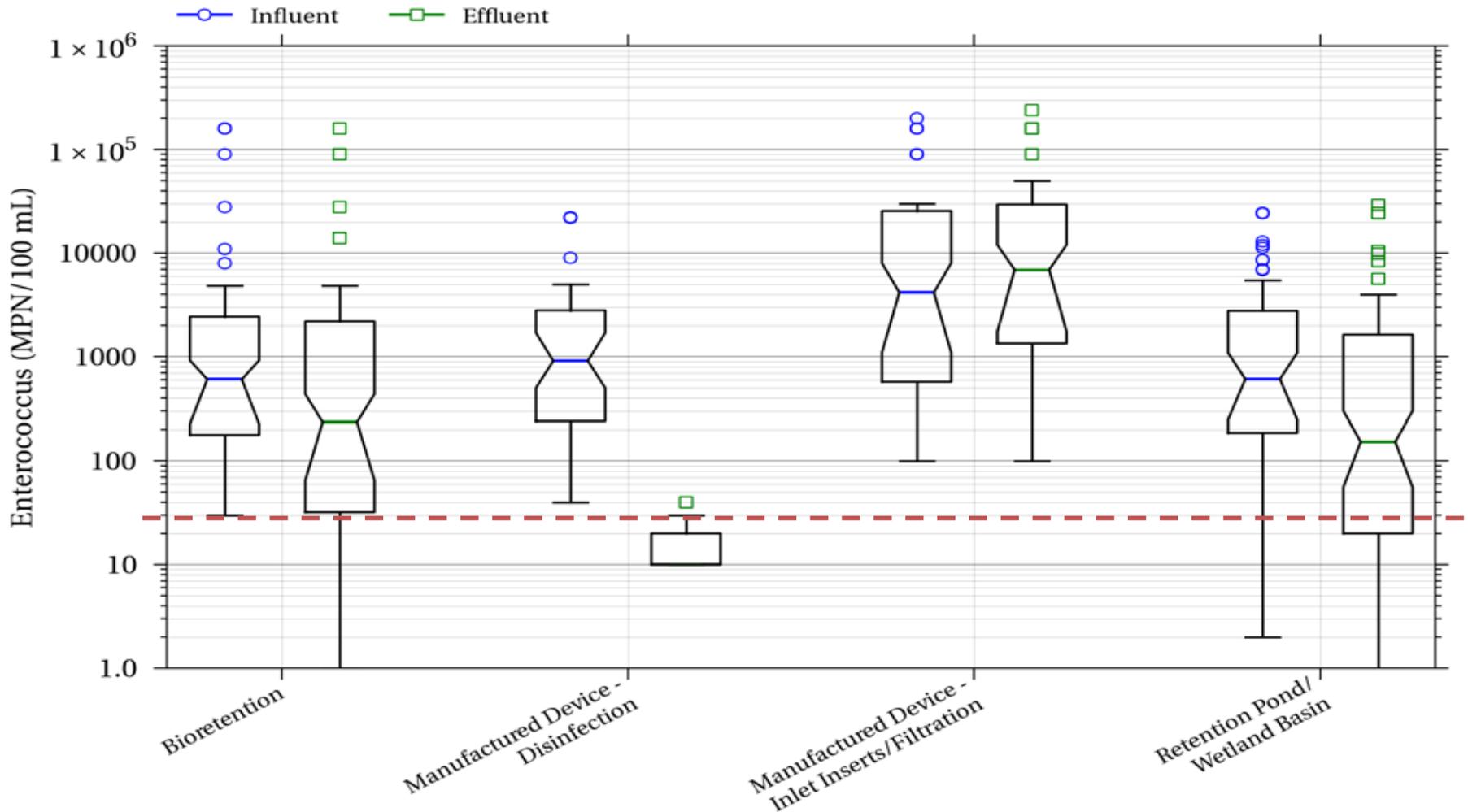
Many reasons to expect variability (and not one answer)



- Below Average Pollutant Inflow Concentrations
- Small storm events
- Mild Pre-Storm Conditions that
 - Decrease Runoff Volumes
 - Result in more capture BMPs
 - Are timed with maintenance
 - Vegetation Cover (seasonality)
- Good BMP Performance
- Multiple water (re)uses available
- No direct loading/sources in receiving waters or from non-anthropogenic sources

- Higher than Average Pollutant Concentrations (build up)
- Higher than Average Rainfall
- Extreme Pre-Storm Conditions that impact
 - Runoff (saturated conditions)
 - Capacity within BMPs (including groundwater levels)
 - Maintenance scheduling
 - Vegetation Cover (seasonality)
- Direct or In-system Loading, Non-Human Contributions, and Regrowth

Attainability (BMP Performance vs WQBELs)



Clary, J., B. Steets, J. Jones, E. Strecker, M. Leisenring.

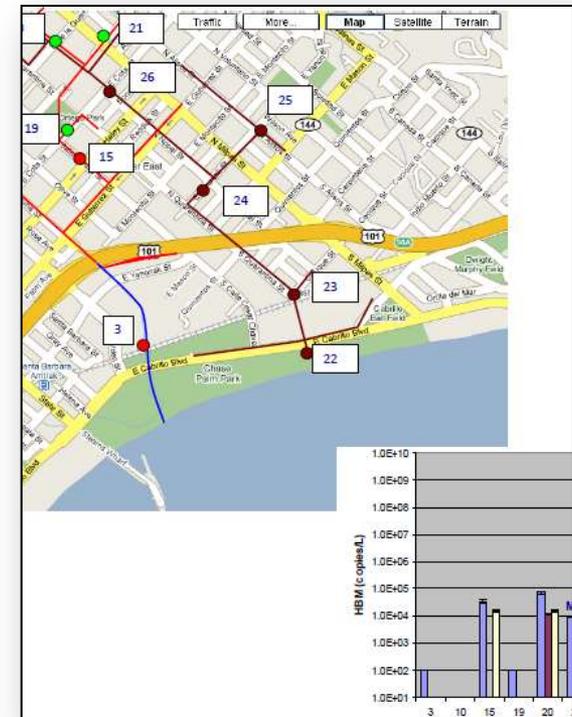
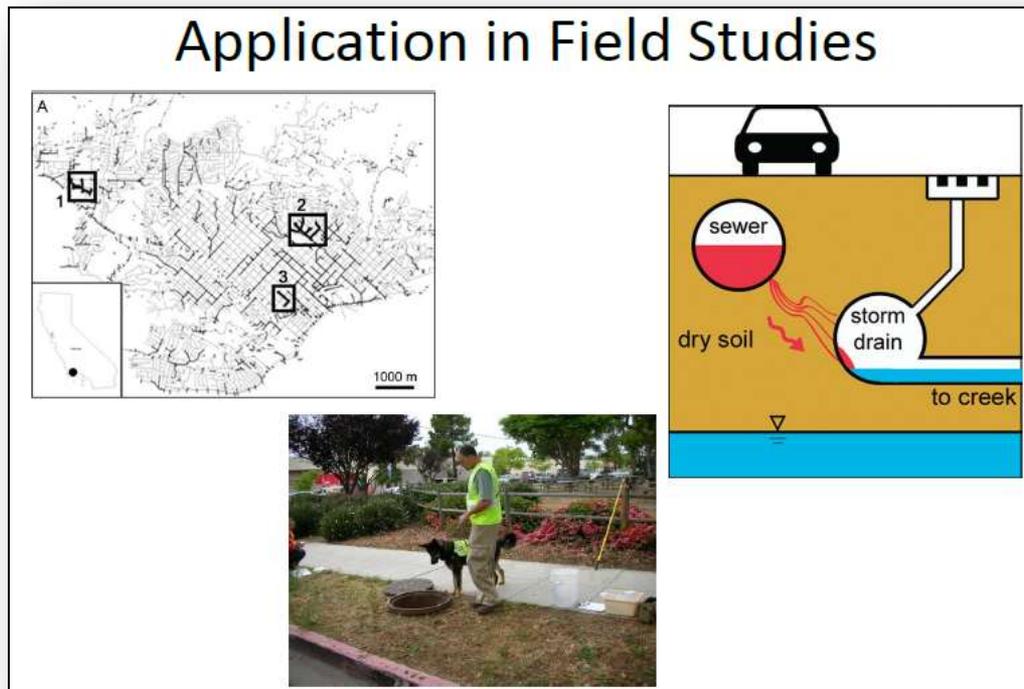
Fecal Indicator Bacteria Reduction in Urban Runoff. October 2012. <www.stormh20.com>.

www.SDMS4Permit.Info



Attainability (Good Projects Not Achieving Attainment)

Non-structural: Santa Barbara - effective source control, still with noncompliance



Attainability (Good Projects Not Achieving Attainment)

- Example of structural + non-structural BMP implementation:
 - Santa Monica Pier
 - Full dry-weather capture - SMURRF
 - Bird trash control and exclusion
 - Sewer connections and rehabilitation
 - High levels of Enterococcus remain
- Direct sources in receiving waters
 - Natural sources (kelp wrack, sediments)
 - Regrowth in enclosed systems
 - Human sources (bather shedding, etc.)



Benefit-Cost (Basis)

- Basis for Cost Estimates
 - San Diego County Copermittees' Comprehensive Load Reduction Plans (submitted to RWQCB October 2012)

Cost Type	Annual Cost	Factor
Current Program	\$119 million	---
Bacteria TMDL	\$156 - 283 million	1.3x- 2.4x
Total	\$275 – 402 million	2.3x– 3.4x

Benefit-Cost (Project Types from CLRPs*)

Wet-Weather Project List

- Non-Structural BMPs
 - Homelessness Waste Management Program Enhancements
 - New Residential/Small-Scale LID Incentive Program
 - Pet Waste Program Enhancements
 - Animal Facilities Management Enhancements
 - Street and Median Sweeping Enhancements
 - Drain Inlet and Conveyance System Cleaning
- Structural BMPs
 - 9 regional projects in SDR
 - 10 regional projects in SLR
 - Green Streets in High Priority Catchments
- Stream Restoration Projects

Dry-Weather Project List

- Non-Structural BMPs
 - Identification and Control of Sewer Discharges to MS4
 - Irrigation Runoff Reduction Enhancements
 - Commercial/Industrial Good Housekeeping Enhancements
- Infrastructure Improvements
 - Stormdrain and/or sewer repair and replacement in additions to existing budget
- Dry-weather Diversions/Treatment
 - 8 Low Flow Diversions
 - UV Treatment - 2175 acres

*San Diego River and San Luis Rey Watershed CLRPs

Benefit-Cost (Example Costs from CLRPs)

- Wet-Weather vs Dry-Weather Cost Summaries (CLRP output from San Diego River and San Luis Rey)

	San Diego River Watershed	San Luis Rey Watershed	Combined	% of Total Cost
Wet-Weather	\$394-820M	\$79-157M	\$473-977M	60-66%
Dry-Weather	\$190-511M	\$43-113M	\$233-624M	33-39%
Studies	\$3-6.5M	\$3-6M	\$6-13M	1%
Compliance Monitoring	\$3M	\$1M	\$4M	<1%
Total	\$590-1340M	\$126-277M	\$716-1618M	

Benefit-Cost (Public Health Benefits)

Regional Public Health Cost Estimates from Los Angeles and Orange County (Given et al, 2006)

	Wet Season (Nov-Apr)		Dry Season (May-Oct)	Total
Health Costs ^a	\$1.6M-\$8.5M		\$19.3M -\$40.8	\$20.9-\$49.3
% of Total Cost	8-17%		80-92%	
Days	Wet Season Wet Weather	Wet Season Dry Weather	Dry Season Dry Weather	
Number of Days	40 ^b	141	184	
Adjusted Health Costs	\$360K-\$1,883K	\$20.5M - \$47.4M		
Adjusted Percent of Total Health Cost	2-4%	96-98%		

^a Given, et al., 2006.

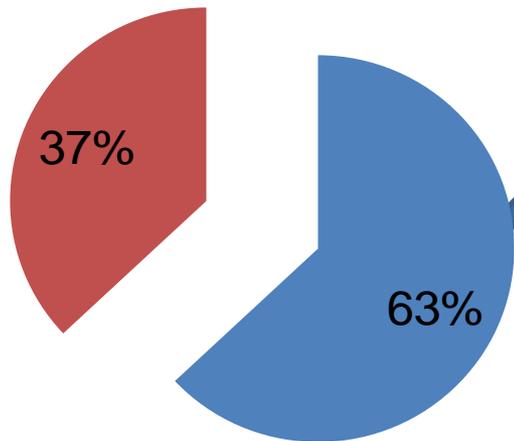
^b Estimate based on six month wet season (181 days). Costs assumed to be proportional to days within season.



Benefit-Cost* (Comparative Public Health Basis)

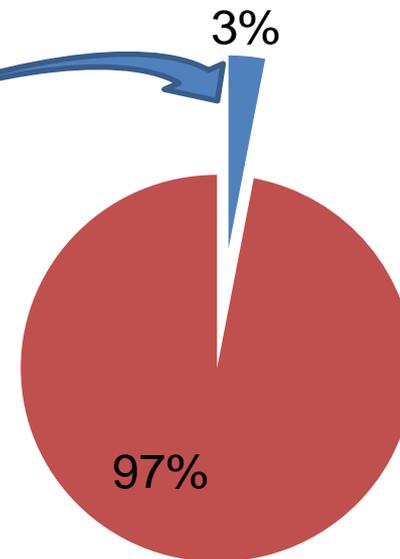
Relative Implementation Costs On Percentage Basis

- Wet-Weather Cost
- Dry Weather Cost



Relative Health Care Costs/Benefits On Percentage Basis

- Wet-Weather Benefit
- Dry Weather Benefit



Costs estimated from the average of high and low estimates from the San Diego river and San Luis Rey Watershed CLRPs



Benefit-Cost (Uncertainties)

- RWQCB did not quantify the benefits of this particular TMDL.
- Uncertainties in Benefit Analysis of other cited studies(Given et al., 2006).
- Discussion from Given study:
 - *Generally speaking, it will be more difficult to reduce contaminant levels at cleaner beaches. At beaches with high attendance and generally good water quality... policy managers should continue dry weather source reduction efforts (e.g., education campaigns and watershed management), but should also recognize that the cost of eliminating all beach contamination may outweigh the marginal public health benefits of doing so. [emphasis added]*

Benefit-Cost (Composite Wet-Dry Study)

- City of San Diego-commissioned study performed by economists at Point Loma Nazarene University (April 2011)
 - Estimated costs to City of San Diego \$3.7B
 - Estimated benefits \$617M
 - Implicit Beach Value (off limit days from 40 to 8)
 - Economic Value (direct spending + multiplier)
 - Health Care Savings (GI, Acute Respiratory Disease, Ear Infection, Eye Infection)
 - Costs outweigh benefits by 6 to 1.

