

Watershed Planning for Improved Water Quality One aspect of Southern California Water Management – Stormwater Quality

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Objectives

- To share experiences and strategies region-wide
- To discuss multiple benefits and financial considerations
- To share conclusions and implications from these watershed planning efforts



2012/2013 MS4 Permits

2012 Los Angeles County

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- Enhanced Watershed Management Programs (EWMPs)
- Watershed Management Programs (WMPs)
- 2013 (2015) San Diego Region
 - Water Quality Improvement Plans (2nd Drafts Submitted in San Diego)
- Incorporation of Total Maximum Daily Loads (TMDLs)
- Disclaimer: still in draft form/comments pending (LA WMPs conditionally approved, presentations November 5th to RWQCB)



Reasonable Assurance Analysis

Reasonable

adj., adv. in law, just, rational, appropriate, ordinary or usual in the circumstances. It may refer to care, cause, compensation, doubt (in a criminal trial), and a host of other actions or activities.

- West's Encyclopedia of American Law, edition 2. (2008).

Assurance

Noun, positive declaration intended to give confidence.

- Dictionary.com (2015)

Reasonable Assurance Analysis "... consists of an assessment (through quantitative analysis or modeling) to demonstrate that the activities and control measures (i.e. BMPs) ... will achieve applicable water quality based effluent limitations and/or receiving water."

LARWQCB (2012)

Arguably the most comprehensive watershedbased planning analyses conducted for MS4 compliance in the nation.

Examples Cited / Data Sources (Public)

~\$15-20M (est) in planning studies! Ventura os Angele 1 - Ballona Creek 2 - Beach Cities 3 - Dominguez Channe 4 - Malibu Creek 5 - Marina Del Rey 6 - North Santa Monica Bay 7 - Palos Verdes Peninsula Orange 8 - Rio Hondo/San Gabriel Ri 9 - Santa Monica Bay Jurisdictions 2-10 - Upper LA River 11 - Upper San Gabriel Rive 12 - Upper Santa Clara River Participating Permittees Watershed Boundary hern Boundary LACF Source: LACDPW

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CASQA

Los Angeles Region

- Upper Santa Clara River
- Malibu Creek
- North Santa Monica Bay
- Santa Monica Bay(J2/J3)
- Marina Del Rey
- Ballona Creek
- Southbay Beach Cities
- Peninsula Cities
- Upper Los Angeles River
- Upper LA River Upper Reach 2
- Lower Los Angeles River
- Dominguez Channel
- Rio Hondo/ San Gabriel
- Upper San Gabriel River
- East San Gabriel River

San Diego Region

- Carlsbad
- Los Penasquitos
- Mission Bay
- San Dieguito
- San Luis Rey
- San Diego Bay
- San Diego River
- Tijuana River



Source: SDRWQCB Geosyntec

Annual Conference – October 19-21, 2015, Monterey, CA

How is Reasonable Assurance Modeled?

- LA MS4 Permit/Models Defined
 - LA MS4 Requirement(Part VI.C.5.b.iv(5)) "Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT)."
 - SBPAT
 - LSPC-SBPAT
 - WMMS (LSPC-SUSTAIN)
 - NS BMP Approaches
- SD Region MS4 Permit Models Used
 - SBPAT
 - LSPC-SBPAT
 - LSPC-SUSTAIN
 - NS BMP Approaches

GIGO





What is SBPAT?

- Jointly developed by Heal the Bay, City of Los Angeles, County of Los Angeles Public Works; funded by the SWRCB, RWQCB and developing partners
- Public Domain, GIS-Based transparent, "open source"
- Land Use/Runoff based algorithms
- Used in Los Angeles, San Diego, Orange, Ventura Counties

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SBPAT Home	X 🚾 Can Healthcare be Cured o X +	
♦ ₩ ♦ www.sbpat.net	▼ × - 100% + Q Search	
Stormwater quality planning	Structural BMP Prioritization and Analysis Tool A tool to support stormwater Reasonable Assurance Analyses and maximize water quality return on investment in urbanized watersheds	
	Home / About SBPAT Downloads Example / Application Useful Documents / Links Contact	

About Structural BMP Prioritization and Analysis Tool (SBPAT)

Structural BMP Prioritization and Analysis Tool (SBPAT) is a public <u>domain</u>, "open source" GIS-based water quality analysis tool intended to 1) facilitate the prioritization and selection of BMP project opportunities and technologies in urbanized watersheds, and 2) quantify benefits, costs, uncertainties and potential risks associated with stormwater quality projects. SBPAT was specifically named by the State of California Los Angeles Regional Water Quality Control Board (RWQCB RB4) as a peer-reviewed, public domain, quantitative model that can be used to develop a Reasonable Assurance Analysis (RAA) in support of a Watershed Management Program (NPDES No. CAS004001).

The prioritization methodology is geared toward optimizing the water quality return on investment (ROI) for user-defined priorities and multiple pollutant types. An example application is the integration of stakeholder priorities with technical data to identify priority BMP activities within a watershed.

The quantification/analysis module utilizes land use based Event Mean Concentrations, Environmental Protection Agency <u>Stormwater Management</u> Model (EPA-SWMM), United States Environmental Protection Agency/ American Society of Civil Engineers (USEPA/ASCE) International BMP Database, site data, and a Monte Carlo approach to



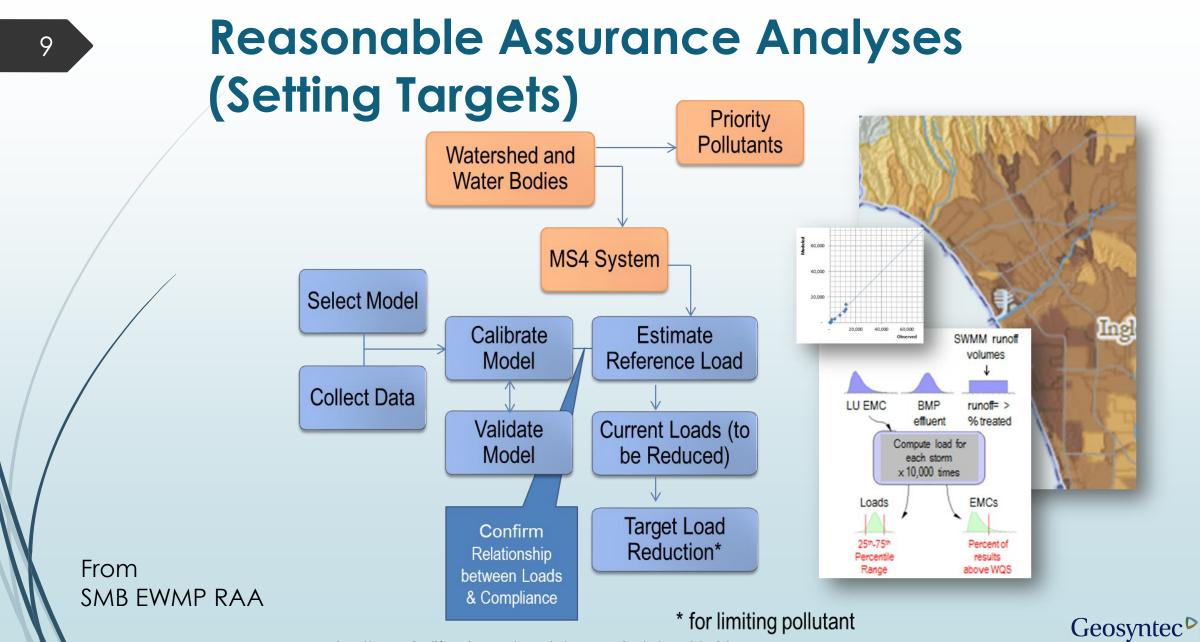


Planning processes vary between regions

Public Outreach & Deliverable Process

- Los Angeles Region
 - Progress/intermediate workshops throughout
 - Technical Advisory Committee/Technical Working Groups
 - RWQCB Guidance
 - Submittal of detailed Work Plan
- San Diego Region
 - Public workshops
 - Representative Consultation Panels
 - Submittals Priorities: H/PWQC & Strategies; Goals, Strategies & Schedules (BMPs and "RAA"); Watershed Management Area Analyses, Water Quality Equivalency Studies

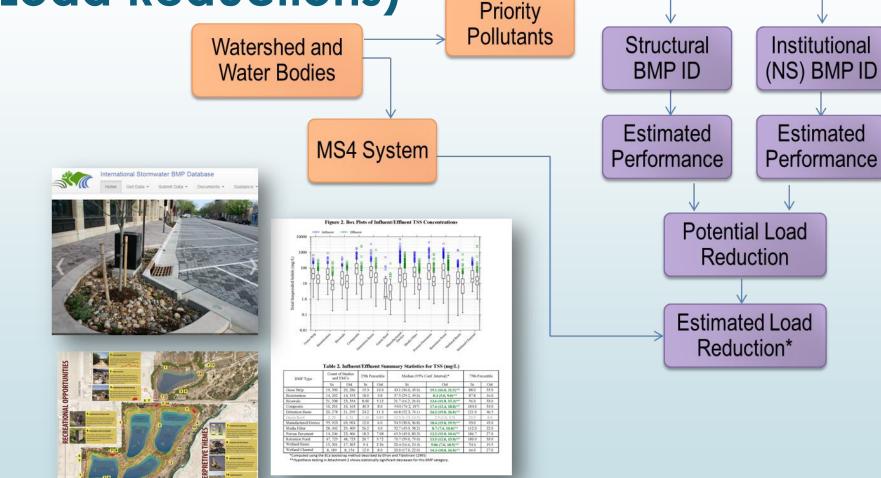




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Reasonable Assurance Analyses (Load Reductions)



From SMB EWMP RAA

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Reasonable Assurance Analyses 11 Results Priority Pollutants Structural Institutional Watershed and **BMP ID** (NS) BMP ID Water Bodies Estimated Estimated MS4 System Performance Performance Select Model Calibrate Estimate Potential Load Model Reference Load Reduction **Collect Data** Current Loads (to **Estimated Load** Verify Model be Reduced) Reduction* **Target Load** COMPLIANCE Reduction* From SMB EWMP RAA * for limiting pollutant Geosyntec[▶] Southern California Water Dialogue, October 28, 2015 consultants

- Non Structural BMPs
 - Source controls
 - Source tracking studies
 - Institutional controls
- Structural BMPs
 - Distributed
 - Centralized/Regional
 - Restoration Projects

Best Management Practices



- Non Structural BMPs
 - Source controls
 - Source tracking studies
 - Institutional controls
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 - Distributed
 - Centralized/Regional
 - Restoration Projects

- Phasing out of copper in brake pads
- Targeting zinc in tires and reducing galvanized steel
- Product replacement
- Enhanced activities





- Non Structural BMPs
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- Microbial Source Tracking (MST) studies
 Identification and
 - elimination of human

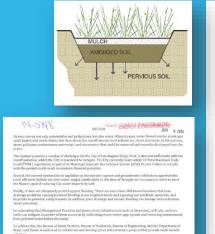






- Non Structural BMPs
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- Low Impact Develop./ Redevelopment Rates
- GI in Public ROW
- Other ordinances





DEVELOPMENT BEST MANAGEMENT PRACTICES HANDBOC LOW IMPACT DEVELOPMENT MANUAL PART B PLANNING ACTIVITES June 2011 4TH EDITION



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 - Restoration Projects

- Green Streets
- Public Parcel Retrofits
- Public Private Partnerships (P3s)



Stormwater Recharge Feasibility and Pilot Project Development Study //ns/ Report August 20.2012



Prepared for

Council for Watershed He

Geosyntec^D

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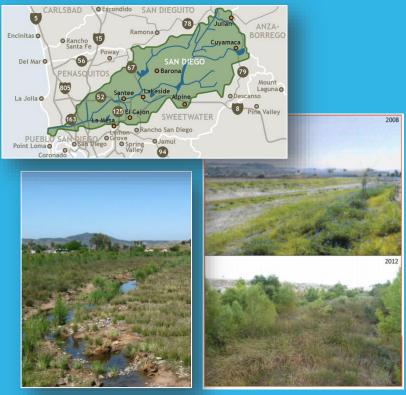
- Capture and Treat
- Wetlands; Infiltration





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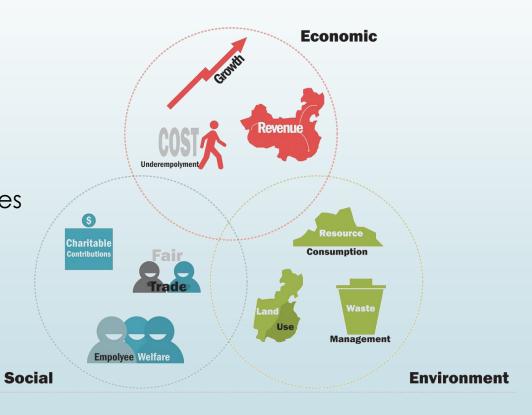
Forrester Creek, SDR WQIP





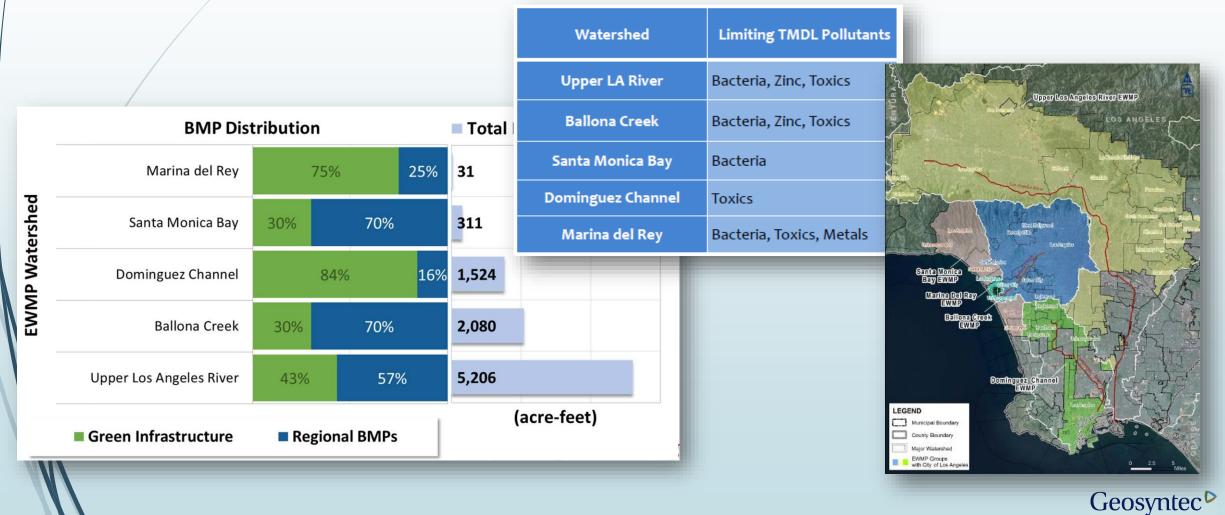
Multiple benefits of regional/ centralized BMPs (beyond WQ)

- Environmental
 - Restoration
 - Habitat
 - Urbanization Effects
- Social
 - Parks/Disadvantaged Communities
 - Trails/Passive & Active Recreation
- Economic
 - Water Supply
 - Jobs (Construction & O&M)
 - Property Values/*





Results: BMP Types (LA Watersheds Example)

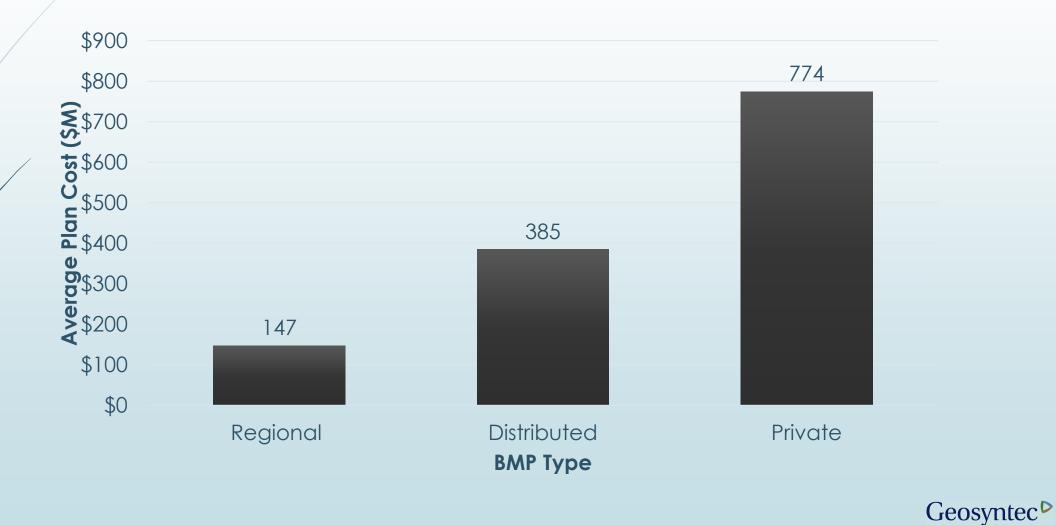


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Totals Costs by BMP Type & Ownership



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Costs/Impervious Area (SD & LA)

Cost per Impervious Acre (\$)

\$400,000	
\$350,000	
\$300,000	
\$250,000	
\$200,000	
\$150,000	
\$100,000	
\$50,000	
\$0	

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Costs variability by POC (SD & LA)

Total Cost by Controlling Pollutant



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The Elephant in the Room... \$17.5B

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- Prop 218 compliant fee studies
- AB 2403 (Rendon) clarifies the definition of "water" under 218 to include urban runoff and all other potential sources of water
- SB 985 (Pavley) Stormwater Resources Plan for Water Bond Funding
- Transportation-related funding (OC Measure M2)
- Regional multi-agency approaches
- Water as a commodity?
 P3s?

Level of confidence for compliance? (what surety do we get for \$17.5B?)

Depends on:

- Protection afforded by TMDLs/WQBELs
- Ability of model to simulate urban/natural processes
- Ability of model to link performance metrics to WQBELs
- Adequacy of data for use as predictive tools
- Characterization of natural variability/performance uncertainty/implementability/variability
- Sources of jursidictional uncertainty (non-MS4s)
- Basis for, and scalability of, capital costs? O&M costs?



How do we increase confidence?

- Adaptive management
- Understand differences between natural variations and data-limited uncertainty
- Conduct studies to confirm/refine watershed characterization data
- Conduct/compile studies to confirm/refine BMP performance data (and compliance metrics)
- Development of "parameterized" new construction cost data (and areas for optimization)
- Analyze new data from CIMPs/MAPs and project implementation



Conclusions

- Significant value in work done best available data and technologies; nationally leading efforts.
- Relevance (partial list of upcoming efforts):
 - South Orange County/Riverside (Hearing Nov 2015)
 - North Orange County (Draft October 2015)
 - SF Bay Area Regional Permits (Draft October 2015)
 - Central Coast WLA Attainment Plans
 - Ventura County
 - Others...
- Water has Value a logical evolution of thinking...



Acknowledgements

- Geosyntec colleagues who mined and synthesized the data presented herein
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- Professional technical community (researchers, consultants)





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