



2012 Winter Conference

Advanced Stormwater Opportunities in Los Angeles

Integration with Open Space and Water Supply

February 14, 2012

Wing Tam, PE – City of Los Angeles, Bureau of Sanitation

Mark Hanna, PhD, PE – Geosyntec Consultants



Presentation Outline

- Background
- Introduction – Integrated Planning
- TMDLs in Los Angeles
- SBPAT for TMDL Implementation Planning
- Linking SBPAT with Open Space (Habitat and Recreation)
- Linking SBPAT with Water Supply Models
- Example Projects from around Los Angeles

Background

CITY OF LOS ANGELES



- **Population served – 4 million**
- **465 square miles**
- **Arid - average rainfall of less than 15 inches/year
- ranging from as little as 3” to as much as 40”**

Watersheds

The City of LA contributes to four major watersheds

- Los Angeles River
- Santa Monica Bay
- Ballona Creek
- Dominguez Channel

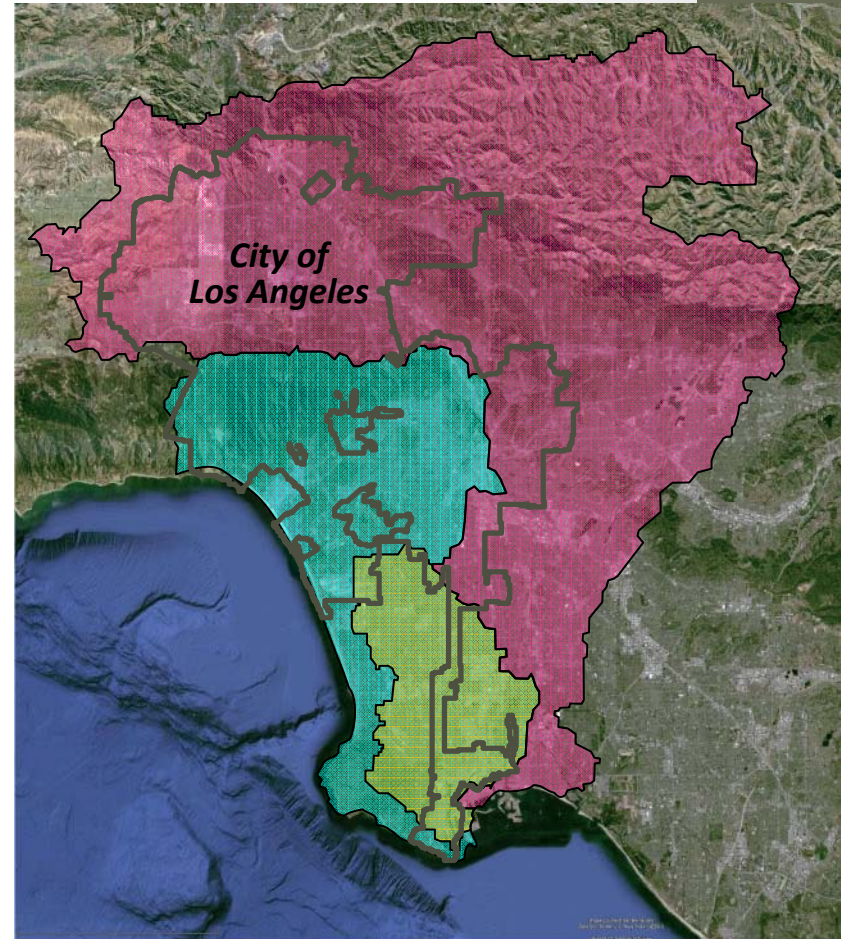
Conveys . . .

- Over 100 MG/day of Dry-Weather Flow
- Average Annually 172,000 acre-feet/yr (based on 15-in of rainfall within the City)
- * Enough to serve 880 homes for 1 year



Stormwater System

- 1,200 miles of pipes
- 100 miles of open channels
- 38,000 catch basins



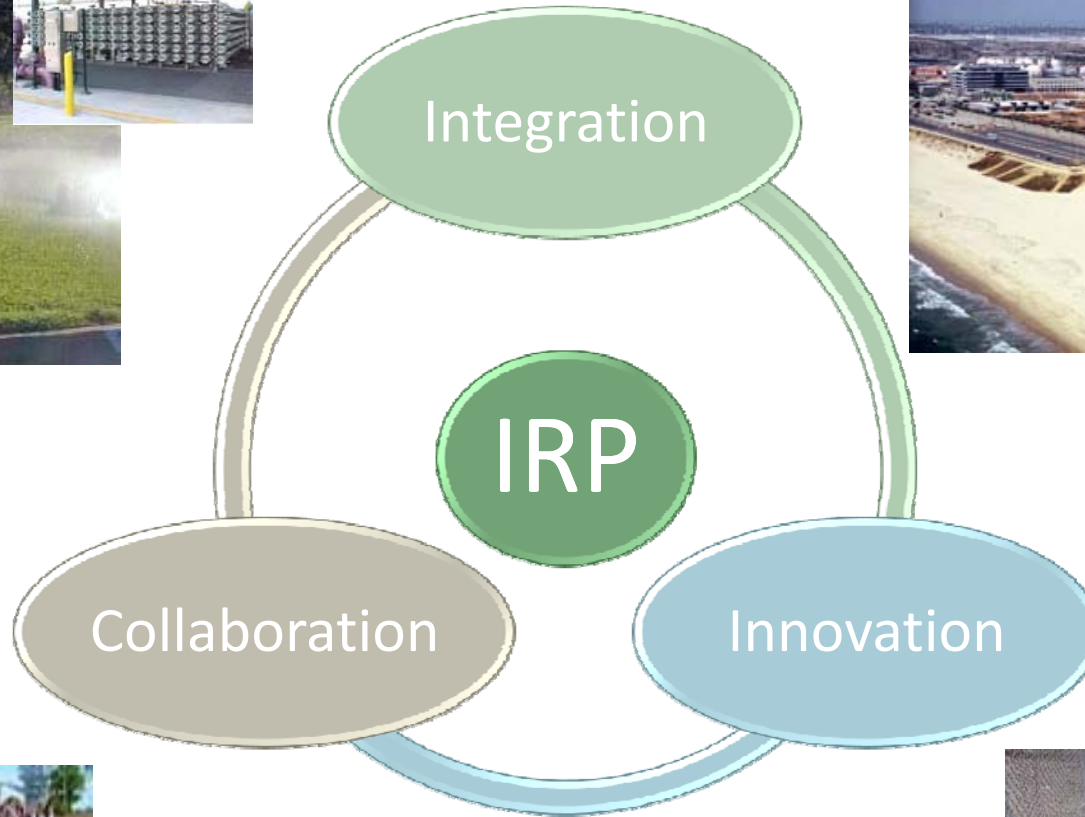
CITY OF
PUBLIC WORKS

Background

- City of Los Angeles Sources of Water



Integrated Planning



CITY OF LOS ANGELES

SANITATION
DEPARTMENT OF
PUBLIC WORKS

engineers | scientists | innovators

Integrated Planning

Basic Premise: CWA – keep pollutants out of our nation's waters

- Integrated Water Quality Planning
- Effective *and* Cost-effective
- Protect Public Health *and* the environment
- Rather than meet one requirement, try to meet many overlapping requirements
- Identify sustainable opportunities and green infrastructure
- Provide habitat, aesthetics, greenways and open space, increasing property values, saving energy, green jobs
- Assist in the development of new water supply

TMDLs Status

- *18 TMDLs are currently adopted by RWQCB-LA (affecting City)*
- *By 2012 all Consent Decree (EPA vs NRDC et al) TMDLs must be adopted*

- **Adopted TMDLs**

- Los Angeles River Trash
- Ballona Creek Trash
- Santa Monica Bay Beaches Bacteria (Dry Weather)
- Santa Monica Bay Beaches Bacteria (Wet Weather)
- LA River Nitrogen
- Marina Del Rey Bacteria
- LA Harbor Bacteria
- Ballona Creek Metals
- LA River Metals
- Ballona Creek Toxics
- Marina Del Rey Toxics
- Ballona Creek Bacteria
- Machado Lake Trash

- Machado Lake Nutrient
- LA River Bacteria
- Dominguez Channel / LA Harbor Metals and Toxics
- Santa Monica Bay Nearshore & Offshore Debris
- Machado Lake Toxics

- **TMDLs in Development**

- Echo Park Lake Toxics
- Lincoln Park Lake Trash, nutrients
- Santa Monica Bay Toxics

TMDLs in Los Angeles

Watershed	Pollutant	Resolution Name	Status
Ballona Creek	Bacteria	Reconsideration of Certain Technical Matters of the TMDL for Bacteria Indicator Densities in Ballona Creek, Ballona Estuary, and Sepulveda Channel	In Development
Multiple	Bacteria	Reconsideration of Certain Technical Matters of the Santa Monica Bay Beaches Bacteria TMDL; the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL; and the Los Angeles Harbor Inner Cabrillo Beach and Main Ship Channel Bacteria TMDL	In Development
Dominguez Channel	Multiple	Los Angeles and Long Beach Harbors Toxic and Metals TMDLs	Approved by Regional Board on 5-May-11
Santa Monica Bay	Debris	Santa Monica Bay Nearshore Debris TMDL	Approved by State Board on 6-Dec-11
Dominguez Channel	Toxics	Machado Lake Toxics TMDL	Approved by State Board on 6-Dec-11
Los Angeles River	Bacteria	Los Angeles River Bacteria TMDL	Approved by State Board on 1-Nov-11
Los Angeles River	Metals	Reconsideration of Los Angeles River Metals TMDL	TMDL In Effect on 3-Nov-11
Dominguez Channel	Nutrients	Machado Lake Nutrient TMDL	TMDL In Effect on 11-Mar-09
Ballona Creek	Metals	Ballona Creek Metals TMDL	TMDL In Effect on 29-Oct-08
Los Angeles River	Metals	Los Angeles Metals TMDL	TMDL In Effect on 29-Oct-08
Los Angeles River	Trash	Trash TMDL for the Los Angeles River Watershed	TMDL In Effect on 23-Sep-08

TMDLs in Los Angeles (cont)

Watershed	Pollutant	Resolution Name	Status
Dominguez Channel	Trash	Machado Lake Trash TMDL	TMDL In Effect on 6-Mar-08
Los Angeles River	Trash	Proposed Resolution to set aside the Los Angeles River Trash TMDL	TMDL In Effect on 17-Jul-06
Ballona Creek	Bacteria	Ballona Creek, Ballona Estuary, and Sepulveda Channel Bacteria TMDL	TMDL In Effect on 27-Apr-07
Santa Monica Bay	Bacteria	Santa Monica Bay Beaches Wet Weather Bacteria TMDL	Approved by Regional Board on 6-Apr-06
Ballona Creek	Toxics	Ballona Creek Estuary Toxic Pollutants	TMDL In Effect on 11-Jan-06
Ballona Creek	Trash	Ballona Creek Trash TMDL-Revision	TMDL In Effect on 11-Aug-05
Los Angeles Harbor	Bacteria	Los Angeles Harbor Bacteria TMDL	TMDL In Effect on 10-Mar-05
Los Angeles River	Nutrients	Los Angeles River Nutrient TMDL (Revision of Interim WLAs)	TMDL In Effect on 27-Sep-04
Los Angeles River	Nutrients	Los Angeles River Nutrients TMDL	TMDL In Effect on 23-Mar-04
Santa Monica Bay	Bacteria	Santa Monica Bay Beaches Wet Weather Bacteria TMDL	TMDL In Effect on 15-Jul-03
Santa Monica Bay	Bacteria	Santa Monica Bay Beaches Dry Weather Bacteria TMDL	TMDL In Effect on 15-Jul-03
Ballona Creek	Trash	Ballona Creek Trash TMDL	TMDL In Effect on 28-Aug-02
Los Angeles River	Trash	Los Angeles River Trash TMDL	TMDL In Effect on 28-Aug-02

SBPAT for TMDL Implementation Planning

1

- *Identify Priority Areas*

2

- *Identify Opportunities*

3

- *Assess Candidate BMPs*

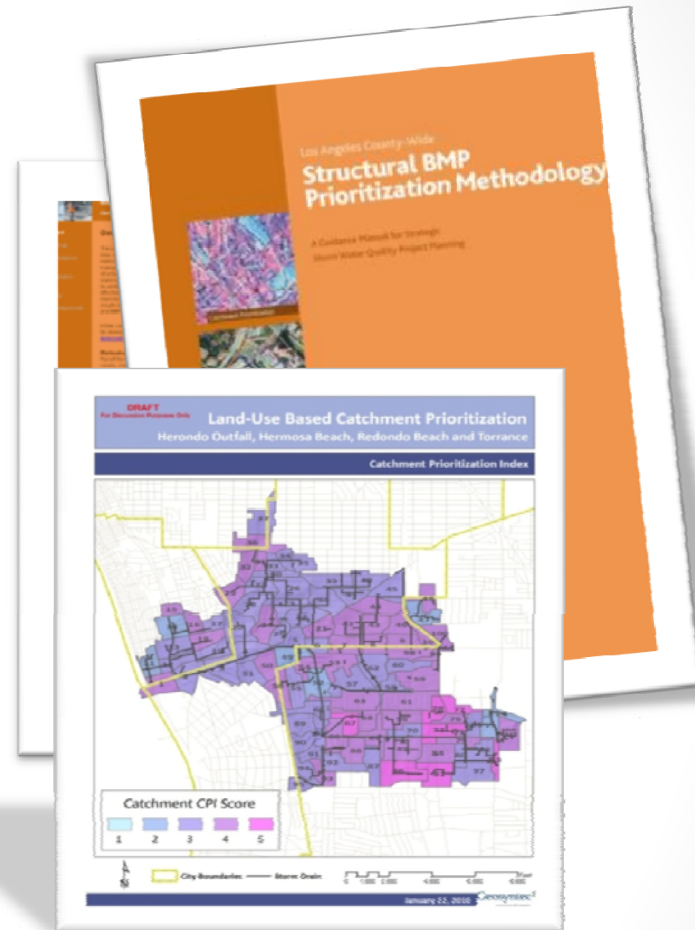
4

- *Conduct Site Specific Verifications*

5

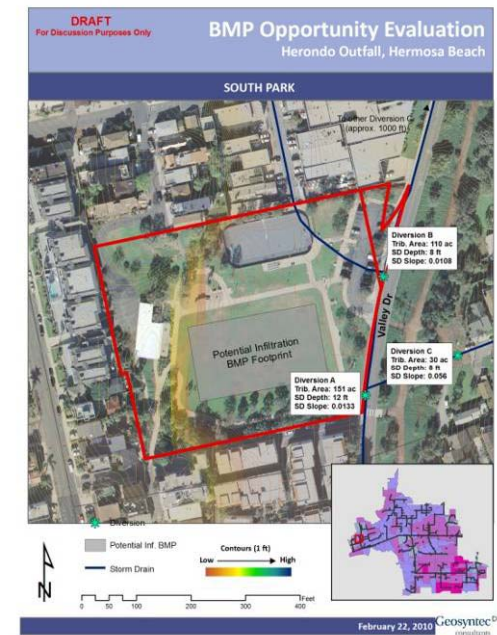
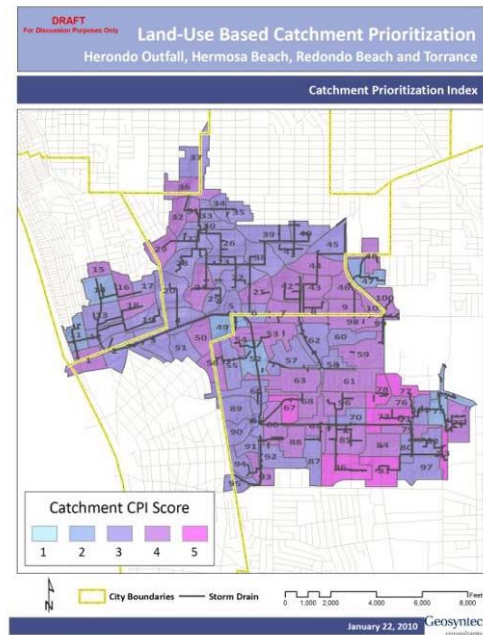
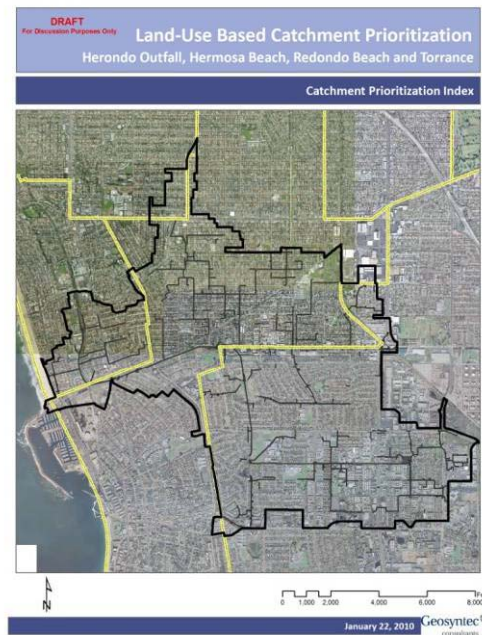
- *BMP Analysis*

www.sbp.at.net



“Structural BMP Prioritization and Analysis Tool”

SBPAT for TMDL Implementation Planning

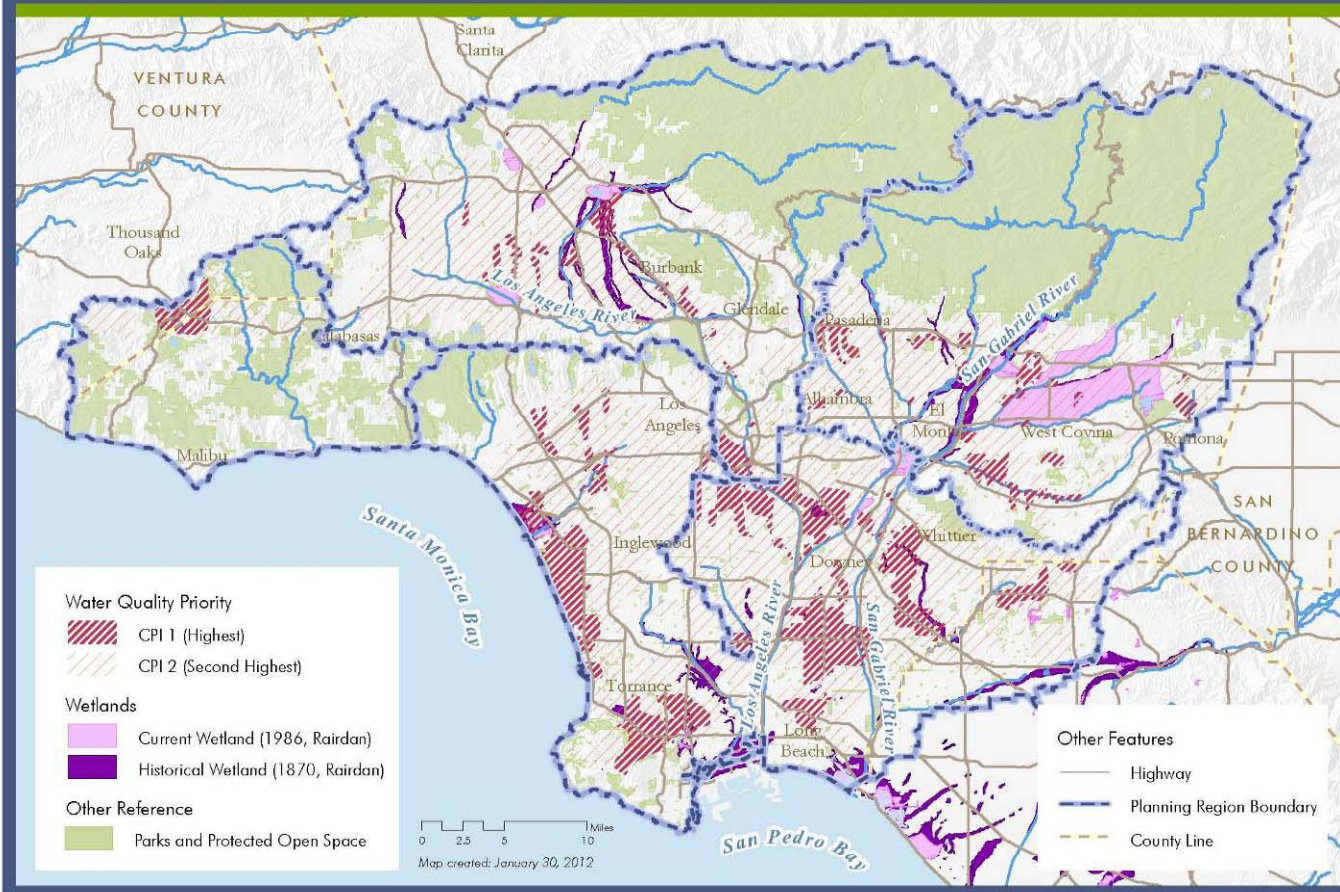


Linking SBPAT with Habitat

Los Angeles Integrated Regional Water Management Plan Update

Water Quality Prioritization with Current and Historical Wetlands - Full Region

DRAFT



Draft – Preliminary Results

Linking SBPAT with Recreation

Los Angeles Integrated Regional Water Management Plan Update

Water Quality Prioritization with Recreation Areas and Greenways - Full Region

DRAFT

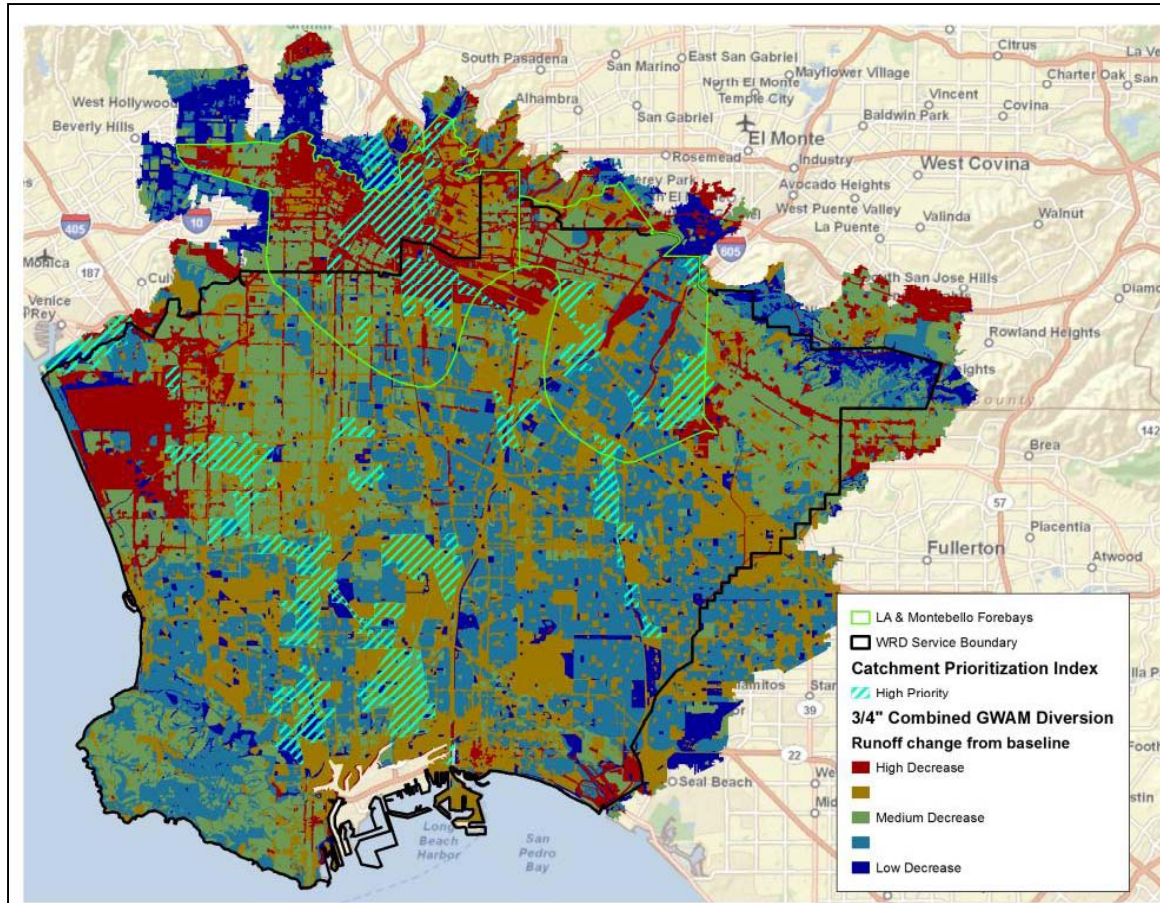


Draft – Preliminary Results

Linking SBPAT with Water Supply Models



GWAM /
MODFLOW



Draft – Preliminary Results



Linking SBPAT with Water Supply Models



GWAM /
MODFLOW

BMP type	Runoff Volume	Infiltrated Volume	Percent Capture
	(10 ⁶ gal/10 yr)	(10 ⁶ gal/10 yr)	(%)
Res prop LID (MR)	3.07	1.57	51%
Res prop LID (MR)	3.22	1.59	49%
Res prop LID (MR)	3.07	1.57	51%
Res prop LID (SFR)	2.12	1.11	52%
Res prop LID (SFR)	1.92	1.07	56%
Res prop LID (SFR)	2.10	1.11	53%
Res street LID	11.63	3.43	29%
Res street LID	11.98	3.45	29%
Res street LID	15.75	5.59	35%
Res street LID	10.49	3.37	32%
Res street LID	8.92	3.23	36%
Res street LID	8.43	3.16	37%
Comm corr BMP	19.48	10.13	52%
Sub-regional	629.6	93.39	15%
TOTAL	670	134	20%

41 ac ft/yr

BMP type	Acres	% Removal	Total Copper (lb/year)		
			Pre Project DS Load	Post Project DS Load	DS Load Reduction
Res prop LID (MR)	9.49	51.0%	0.03	0.02	0.02
Res prop LID (MR)		49.4%	0.03	0.02	0.02
Res prop LID (MR)		51.0%	0.03	0.02	0.02
Res prop LID (SFR)	8.46	52.4%	0.03	0.02	0.02
Res prop LID (SFR)		55.7%	0.03	0.01	0.02
Res prop LID (SFR)		52.7%	0.03	0.02	0.02
Res street LID	9.08	29.5%	0.13	0.08	0.03
Res street LID		28.8%	0.14	0.09	0.03
Res street LID		35.5%	0.18	0.10	0.06
Res street LID		32.2%	0.18	0.11	0.05
Res street LID		36.2%	0.16	0.09	0.05
Res street LID		37.5%	0.15	0.08	0.05
Comm corr BMP	4.84	52.0%	0.85	0.41	0.44
Sub-regional	32/228*	14.3%	14.4	11.7	2.0
Total System		20.0%	*Sub-regional system developed to capture 2" storm from the 32 acre "area of interest"		
Total System (considering only the area of interest)		63%			

Draft – Preliminary Results



Example Projects

***Sun Valley Park Project -
Infiltration galleries***



***Green Alley /
Green Streets
Program***



CITY OF LOS ANGELES



SANITATION
DEPARTMENT OF
PUBLIC WORKS

Geosyntec
consultants

engineers | scientists | innovators

Green Streets Projects

Oros Street – LA's First Green Street
Capture private and public runoff

Riverdale Avenue – Green Streets Program
Demonstrate and monitor Green Streets

Elmer Avenue – Water Augmentation Study
Combined distributed and regional solution

South Park – Ultra-urban Application
Hope Street and Grand Ave.



Example Projects

Westside Park Rainwater Irrigation Project



Strathern Wetlands



DEPARTMENT OF
PUBLIC WORKS

engineers | scientists | innovators

Example Projects

Garvanza Park



CITY OF LOS ANGELES











SANITATION
DEPARTMENT OF
PUBLIC WORKS

Geosyntec

consultants

engineers | scientists | innovators

Example Projects

Pre-Conditions	Post-Conditions
Residential	
 Google Images, Geosyntec	 Elmer Ave. Green Street Project
Commercial	
 Geosyntec	 Geosyntec
Industrial	
 Geosyntec	 Eichlvision.com
Regional	
 Geosyntec	 Contec Construction Products, Inc.

Broadway Neighborhood Greenway Project

in association with

The Water Replenishment
District of Southern California

and the

Council for Watershed Health



Questions?

CITY OF LOS ANGELES



SANITATION
DEPARTMENT OF
PUBLIC WORKS

Geosyntec
consultants

engineers | scientists | innovators

Contact

- Wing Tam, Wing.Tam@lacity.org
- Mark Hanna, mhanna@geosyntec.com