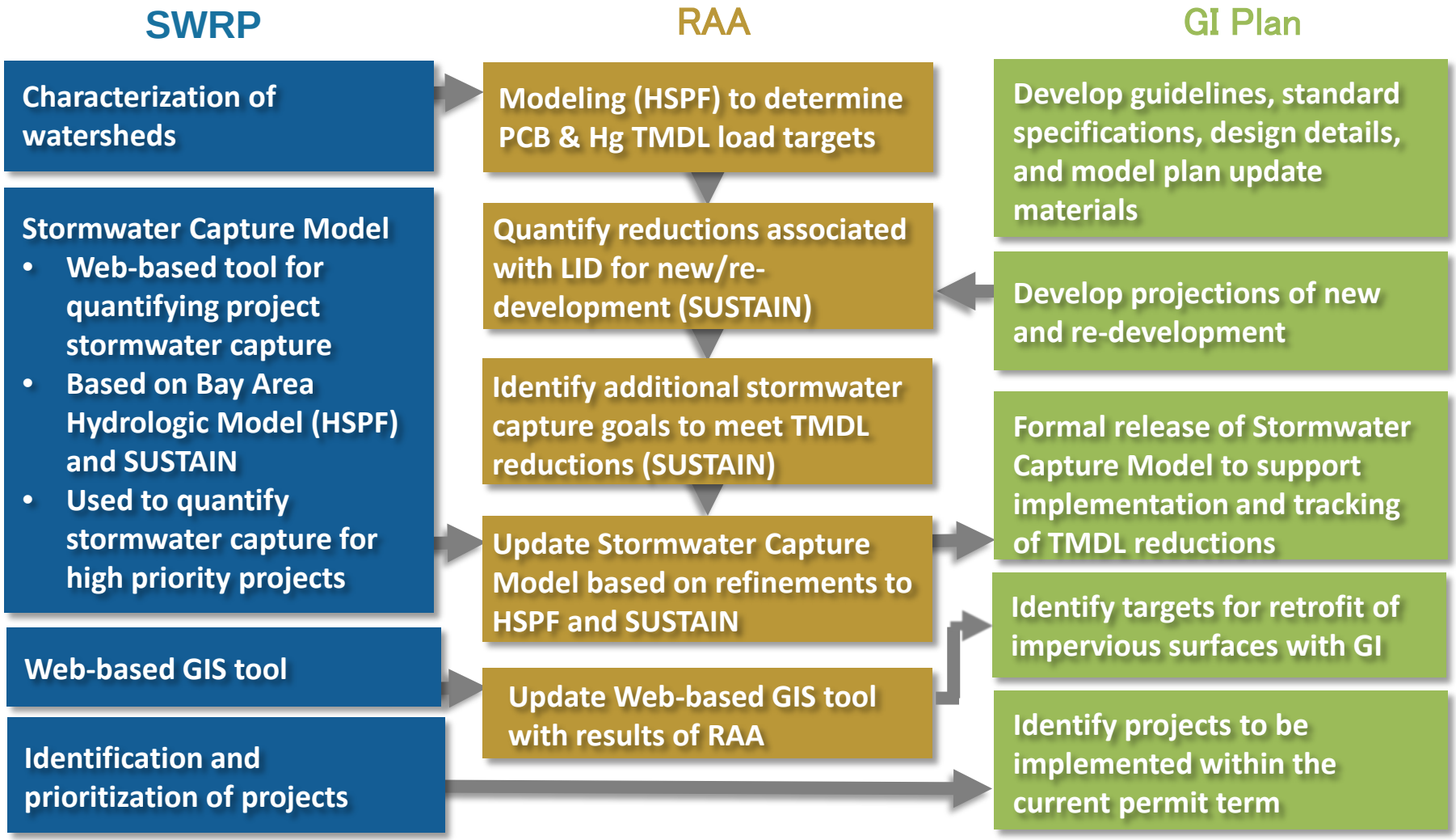
San Mateo County Storm Water Resource Plan

Matthew Fabry, P.E.

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.
www.flowstobay.org

CASQA Effectiveness Assessment Sub-Committee
November 16, 2016


SWRP
RAA
GI Plan
Characterization of watersheds
Stormwater Capture Model
• Web-based tool for quantifying project stormwater capture
• Based on Bay Area Hydrologic Model (HSPF) and SUSTAIN
• Used to quantify stormwater capture for high priority projects
Web-based GIS tool
Identification and prioritization of projects
Modeling (HSPF) to determine PCB & Hg TMDL load targets
Quantify reductions associated with LID for new/re-development (SUSTAIN)
Identify additional stormwater capture goals to meet TMDL reductions (SUSTAIN)
Update Stormwater Capture Model based on refinements to HSPF and SUSTAIN
Update Web-based GIS tool with results of RAA
Develop guidelines, standard specifications, design details, and model plan update materials
Develop projections of new and re-development
Formal release of Stormwater Capture Model to support implementation and tracking of TMDL reductions
Identify targets for retrofit of impervious surfaces with GI
Identify projects to be implemented within the current permit term

Project Types

Regional Projects

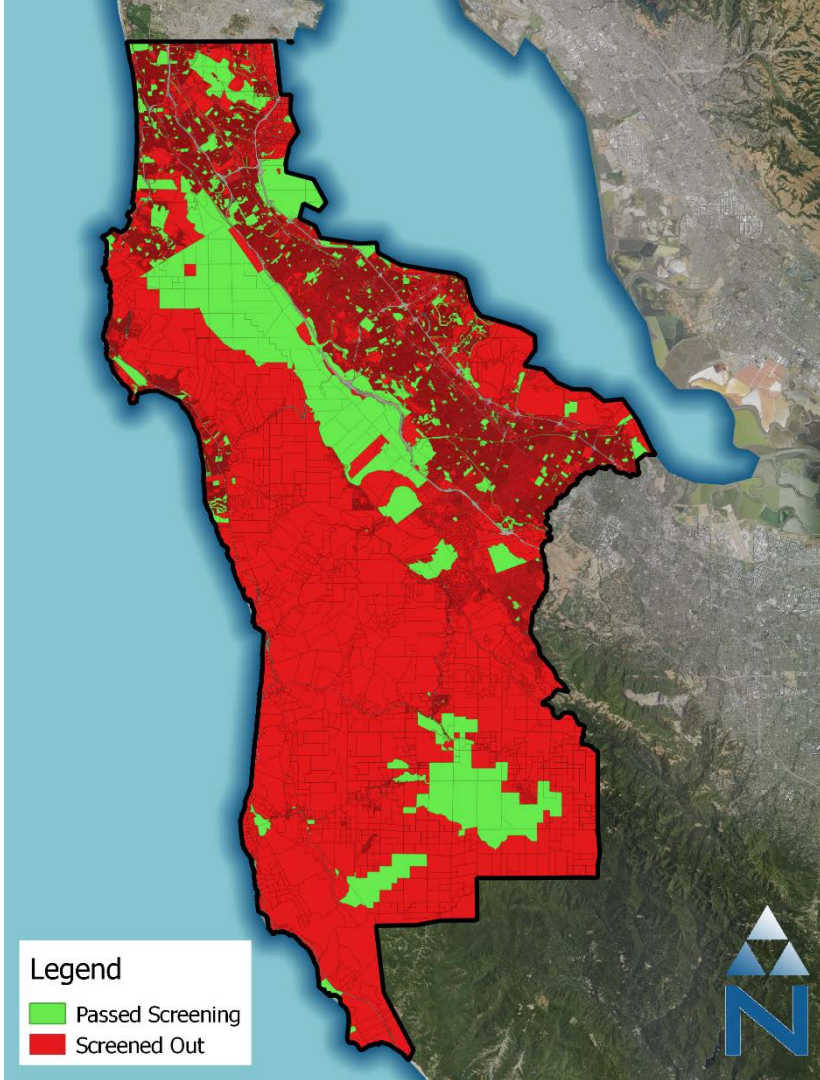
Green Streets

Low Impact Development

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

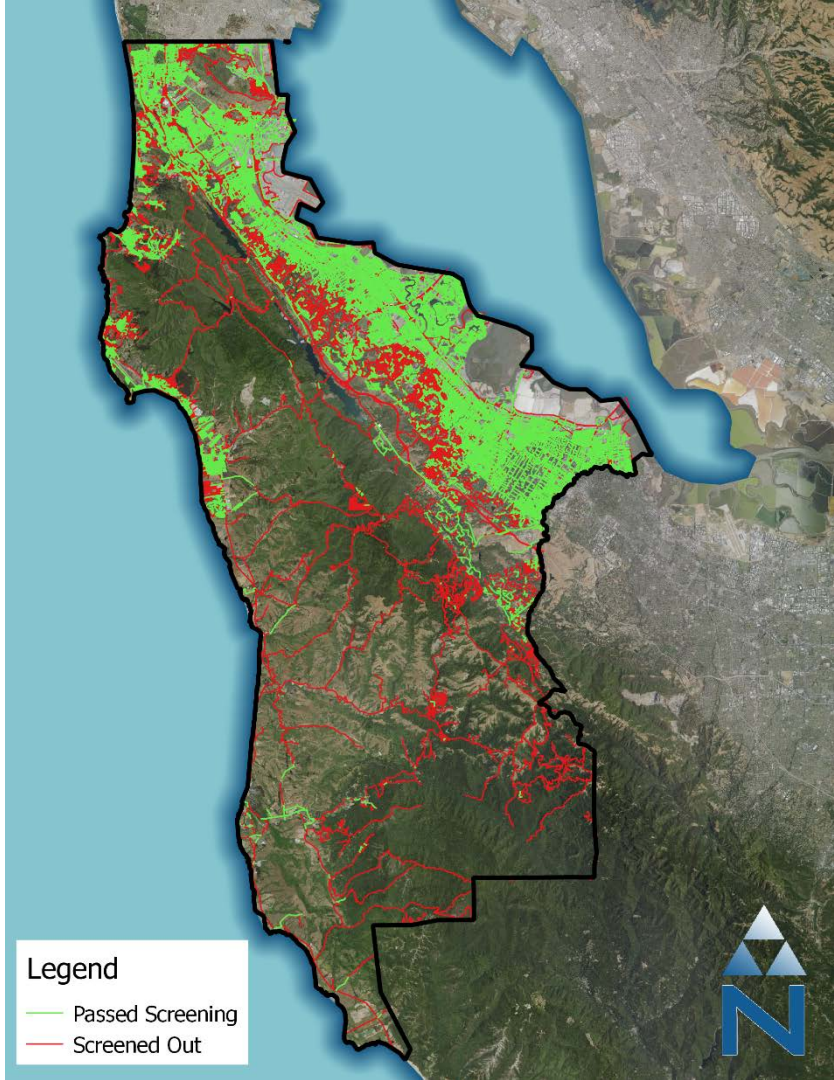
Screening of Sites for Onsite LID/Regional Projects

Screening Factor	Parcel Characteristic	Criteria	Reason
Public Parcels	Ownership	City, County or Town	Identify all public parcels for regional storm and dry weather runoff capture projects or onsite LID retrofits
	Land Use	Park, School, Other (e.g., Golf Course)	
Suitability	Parcel Size	>0.25 acres	Adequate space for regional stormwater and dry weather runoff capture project
		All	Opportunity for onsite green infrastructure retrofit
	Site Slope	< 10 %	Steeper grades present additional design challenges



Green Street Screening

Screening Factor	Street Section Characteristic	Criteria	Reason
Selection	Functional Class	S1400 S1730 S1780	Local neighborhood road, rural road, city street, alley, parking lot roads
Suitability	Ownership	Private	Potential projects are focused on public and right-of-way opportunities
	Road Slope	< 5%	Steep grades present additional design challenges; reduce capture opportunity due to increased runoff velocity



Example Regional Project Quantitative Scoring

Table 4-1. Parcel prioritization criteria for regional stormwater capture

	Points						Weight Factor
	0	1	2	3	4	5	
Parcel Land Use	--	--	Schools/Golf Courses	Public Buildings	Parking Lot	Park / Open Space	--
Impervious Area (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	60 ≤ X < 80	80 ≤ X < 100	--
Parcel Size (acres)	0.25 ≤ X < 0.5	0.5 ≤ X < 1	1 ≤ X < 2	2 ≤ X < 3	3 ≤ X < 4	4 ≤ X	--
Hydrologic Soil Group	--	D	Unknown	C	B	A	--
Slope (%)	5 < X ≤ 10	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	--
Proximity to Flood-prone Channels (miles)	Not in sub-basin	3 < X	--	1 < X ≤ 3	--	X ≤ 1	2
Contains PCB Risk Areas	None	Redeveloped-Low	Redeveloped-Moderate	Moderate	High-Low / Redeveloped-High	High-High / High-Moderate	2
Currently planned by City or co-located with other City project	No					Yes	2
Drains to TMDL water	No					Yes	
Above groundwater basin	No		Yes				--
Augments water supply	No	Yes					--
Water quality source control	No	Yes					--
Reestablishes natural hydrology	No	Yes					--
Creates or enhances habitat	No	Yes					--
Community enhancement	No	Yes					--

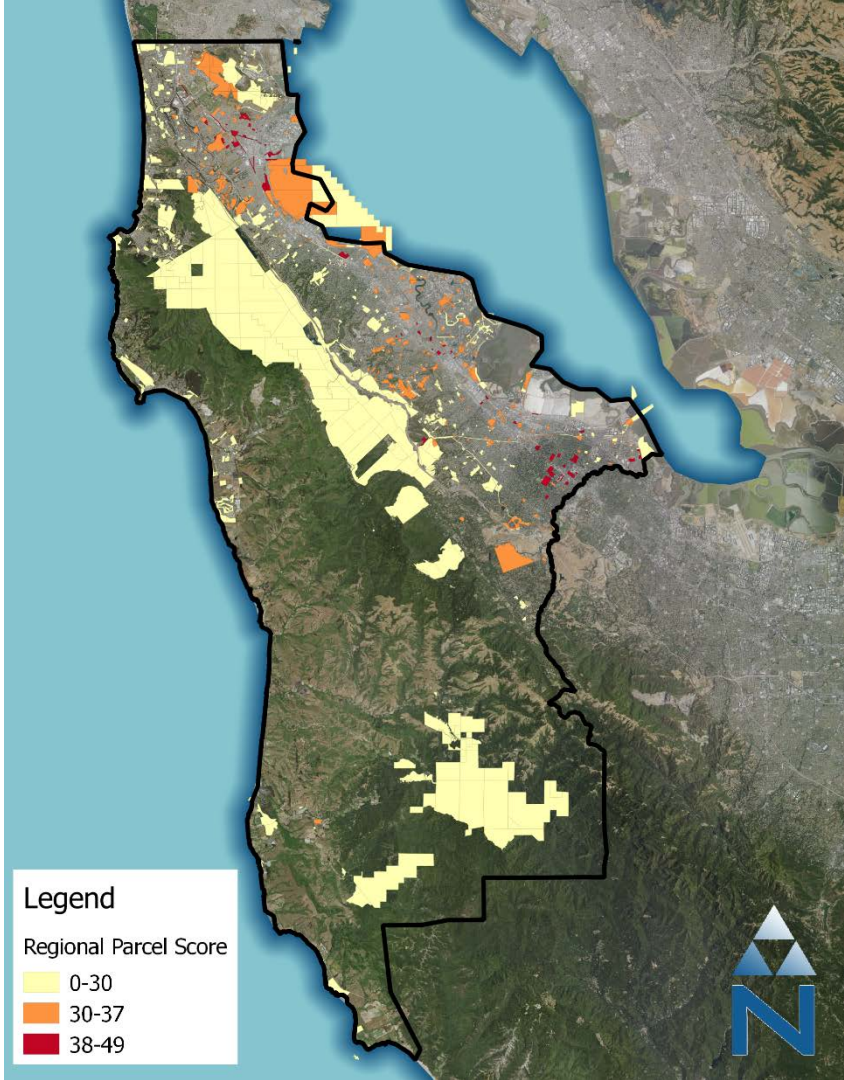
SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Regional Projects

Total # of Screened Parcels: 1,841

Low score: 1,091
Medium score: 670
High score: 80

Rank	Score	Jurisdiction	APN	Co-located Project
1	49	Menlo Park	071102400	Parking Plaza 7 Renovation
2	49	Menlo Park	071281160	Parking Plaza 7 Renovation
3	49	Menlo Park	071285160	Parking Plaza 7 Renovation
4	48	Menlo Park	071283140	Parking Plaza 7 Renovation
5	48	Menlo Park	071094180	Parking Plaza 7 Renovation
6	48	Menlo Park	071284100	Parking Plaza 7 Renovation
7	48	Menlo Park	071092290	Parking Plaza 7 Renovation
8	46	Menlo Park	071273160	Parking Plaza 7 Renovation
9	45	South San Francisco	015180180	
10	45	South San Francisco	015180170	
…	…	…	…	



Example Green Street Quantitative Scoring

Table 4-1. Right-of-Way prioritization criteria for green streets

	Points						Weight Factor
	0	1	2	3	4	5	
Street Type	Highway	--	Arterial	Collector	Alley	Local	--
Imperviousness (%)	X < 40	40 ≤ X < 50	50 ≤ X < 60	60 ≤ X < 70	60 ≤ X < 80	80 ≤ X < 100	--
Hydrologic Soil Group	--	D	Unknown	C	B	A	--
Slope (%)	--	4 < X ≤ 5	3 < X ≤ 4	2 < X ≤ 3	1 < X ≤ 2	0 < X ≤ 1	--
Proximity to Flood-prone Channels (miles)	Not in sub-basin	3 < X	--	1 < X ≤ 3	--	X ≤ 1	2
Contains PCB Risk Areas	None	Redeveloped -Low	Redeveloped -Moderate	Moderate	High-Low / Redeveloped-High	High-High / High-Moderate	2
Currently planned by City or co-located with other City project	No					Yes	2
"Safe Routes to School" program	No					Yes	2
Drains to TMDL water	No					Yes	--
Above groundwater basin	No		Yes				--
Augments water supply	No	Yes					--
Water quality source control	No	Yes					--
Reestablishes natural hydrology	No	Yes					--
Creates or enhances habitat	No	Yes					--
Community enhancement	No	Yes					--

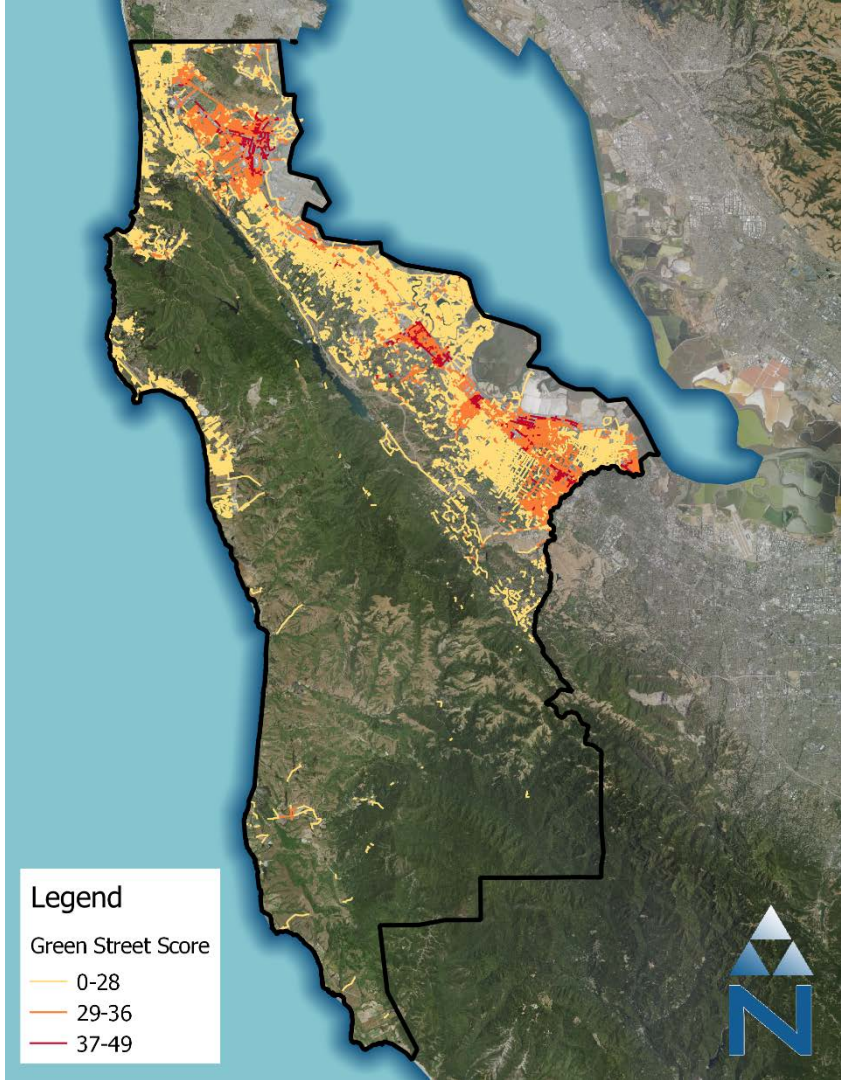
SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Green Streets

Total # of Screened ROW segments: 16,366
Median Segment Length: 320 ft

Low score: 11,086
Medium score: 4,547
High score: 733

Rank	Score	Street Name	TIGER Census Roads ID (STNA_ID)	Length (ft)
1	49	Airport Blvd	322632	374
2	49	Santa Cruz Ave	1717	225
3	48	Grand Ave	269532	235
4	48	Airport Blvd	322632	370
5	48	Chestnut St	284618	145
6	47	Alma St	235064	798
7	47	E Grand Ave	327309	228
8	47	Meadow Ct	3011441	135
9	47	San Miguel Way	3010534	303
10	47	San Miguel Way	3010534	419
…	…	…	…	…



Reasonable Assurance Analysis

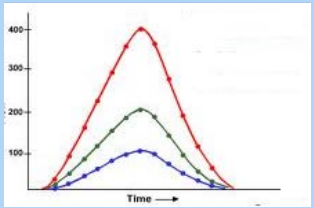
HSPF

Data
- Rainfall
- HRUs/Land Use
- Impervious
- Elevation
- Slopes
- Evaporation
- Infiltration

Watershed Model

Results

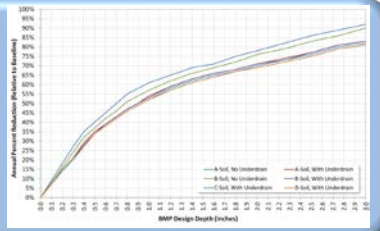
Hourly runoff and sediment/pollutant loads



SUSTAIN

Stormwater Capture Model

GI Response



Stormwater Capture Model

Calculation of project capture volumes

Storm Water Capture Model

Version 0.1
(updated 6/30/2016)

BMP Type

24-hour Rainfall Depth (in.)

0.50"

Drainage Area (ac.)

acres

Percent Impervious (0-1.0)

0.0 - 1.0

BMP Footprint (sq. ft.)

square feet

Ponding Depth (ft.)

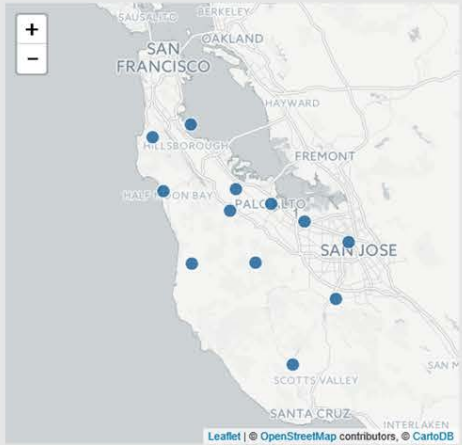
feet

Constant Infiltration (in./hr.)

in./hr.

Calculate

Sumary	Value	Units
Runoff Volume	--	acre-feet
Volume Capture	--	acre-feet
Percent Capture	--	%



Use this map to reference rainfall gage statistics near your project site. The 85th %-tile, 24-hour rainfall depth estimates were developed using NCDC Global Historical Climatology Network (GHCN) data from Water Years 1981 through 2015.

Additional Quantitative Modeling Analysis for High Priority Projects

- Modeling performed for highest ranked projects selected for project concepts
- Stormwater Capture Model will enable each city to perform similar analysis for future grant applications

Project Name	Jurisdiction	Project Type	Volume Reduced (ac-ft/yr)	PCB Reduced (mg/yr)	Hg Reduced (mg/yr)
Orange Memorial Park	South San Francisco	Regional	455	7,081	50,242
Twin Pines Park	Belmont	Regional	9.95	155	1,098
Holbrook-Palmer Park	Atherton	Regional	242	3,769	26,746
Addison Avenue	East Palo Alto	Green Street	1.55	24.2	171.5
East Poplar Avenue	San Mateo	Green Street	1.46	22.7	161.1
Grand Avenue	South San Francisco	Green Street	1.31	20.3	144.3
San Anselmo Avenue	Millbrae	Green Street	4.56	71.0	503.7
Chapin Avenue	Burlingame	Green Street	4.93	76.6	543.7
Valley Drive	Brisbane	Green Street	2.16	33.5	237.9
Ruth Avenue	Belmont	Green Street	3.80	59.1	419.4
Alma Street	Menlo Park	Green Street	7.26	113.0	801.7
Rosewood Avenue and Elm Street	San Carlos	Green Street	16.93	263.3	1,868.5
Middlefield Road	Redwood City	Green Street	4.47	69.5	492.8
Hillside Boulevard	Colma	Green Street	2.67	41.5	294.8
Kennedy Middle School Green Streets	Redwood City	Green Street	3.51	54.6	387.7
Beach Park Boulevard	Foster City	Green Street	7.51	116.8	828.8
San Bruno Avenue East	San Bruno	Green Street	3.73	58.1	412.0
Rosita Road	Pacifica	Green Street	1.50	23.3	165.1
Middlefield Parking Lot	San Mateo County	LID Retrofit	0.56	8.7	61.6
City Hall Parking Lot	Half Moon Bay	LID Retrofit	0.66	10.3	73.0
Beresford Park	San Mateo	LID Retrofit	1.50	23.4	166.0
Doelger Senior Center	Daly City	LID Retrofit	3.07	47.8	339.4