Stormwater Management in San Mateo County

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San Mateo Countywide Water Pollution Prevention Program

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Countywide Water Coordinating Committee
May 17, 2017

Stormwater – What's the Big Deal?

- Urbanization = impervious and polluted
- Impervious = less infiltration
- Stormwater washes pollutants away
- Flows into inlets and underground pipes
- Goes directly to creeks, the Bay, or ocean
- No treatment to remove any pollutants
- Bad for water quality, human health, aquatic life, aesthetics

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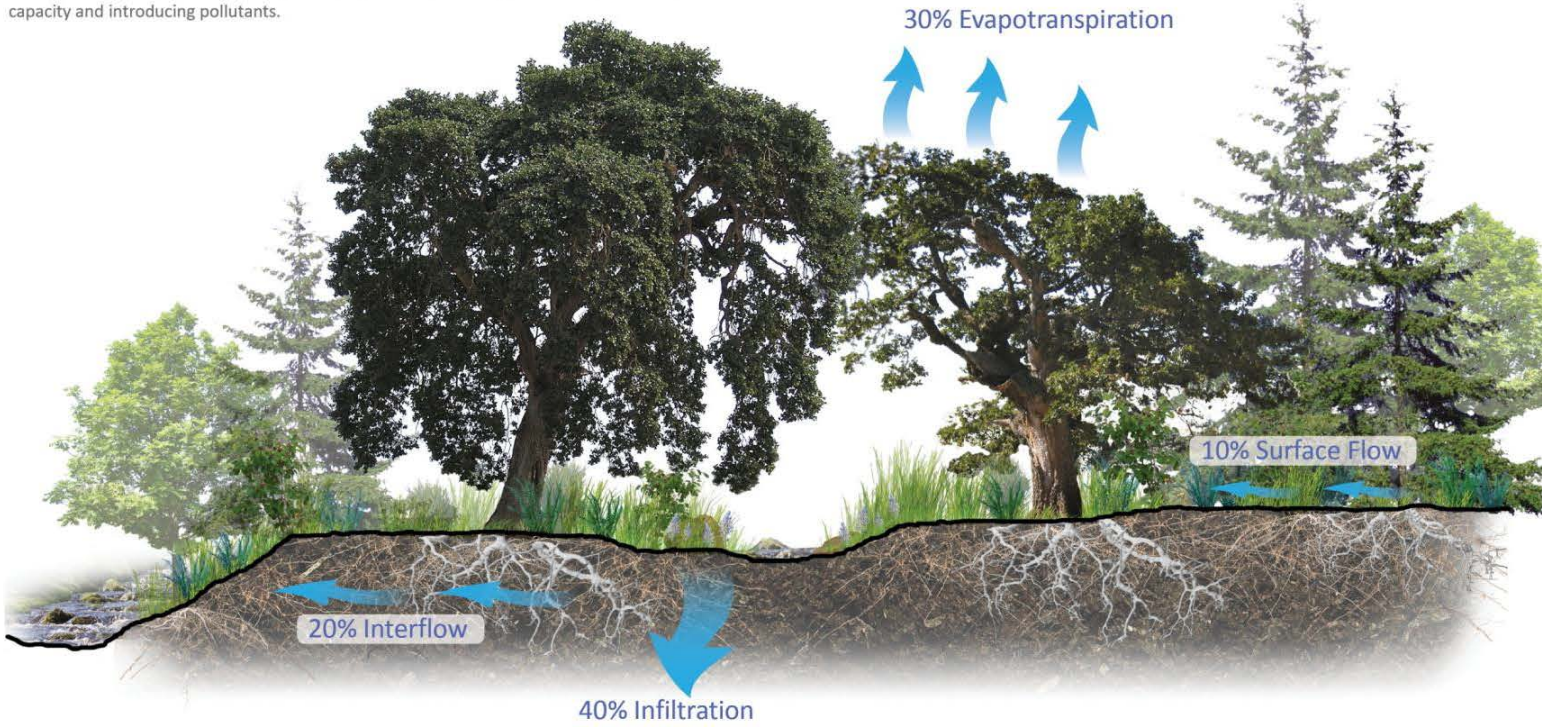
1.2 Pre-Urban Development

A Healthy Landscape

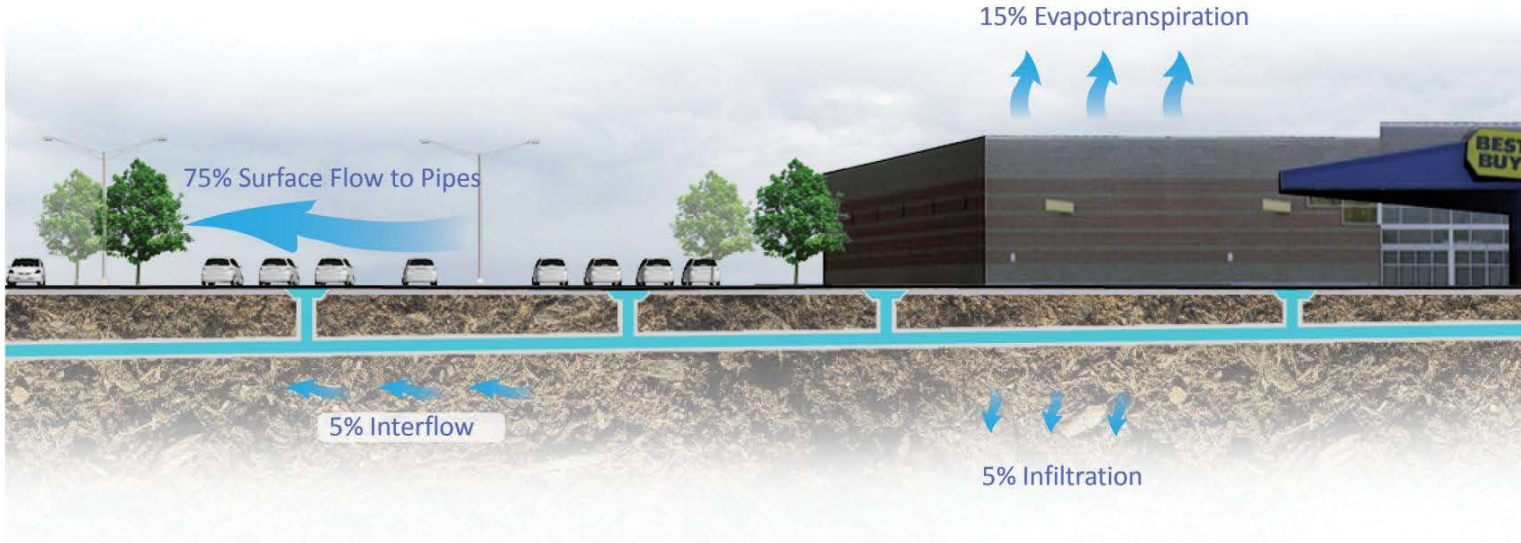
A healthy, undisturbed landscape acts like a sponge by capturing, absorbing, and slowing the flow of water from the moment a raindrop lands on the ground. Urban development, though, has dramatically impacted natural hydrologic systems by reducing the landscape's absorptive capacity and introducing pollutants.



1.3 Urban Development

The Effects of Impervious Area

When the natural landscape is urbanized, impervious surface is created that prevents water from being absorbed at the source. Sediments and pollutants from streets, parking lots, homes, yards, and other sources are washed into pipes and water bodies. Stormwater runoff increases as more and more impervious surface is created. The high volume and velocity of stormwater runoff emptying into creeks and streams may cause flooding and erosion, destroying natural habitat. There is a better approach.



What Pollutants?

- Trash/Litter
- Pesticides
- Nutrients/Fertilizers
- Mercury
- PCBs
- Construction Materials
- Vehicle-Related
  - Metals
  - Oil/Hydrocarbons
  - Washwater
- Bacteria
  - Pet waste, livestock, sewer, etc.
- Flow

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Mercury & PCBs

- Accumulate in Bay fish – human health hazard
- Mercury – legacy problem, but airborne deposition results in ongoing discharges
- PCBs – used widely, now banned, but still in environment
- Attach strongly to sediment/particles
- Get washed by rainwater into SF Bay

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The Municipal Regional Permit

- Issued by SF Bay Regional Water Board
- 76 municipal permittees
  - San Mateo, Santa Clara, Alameda, Contra Costa Counties, Cities of Fairfield, Suisun City, Vallejo
- Addresses full spectrum of stormwater issues
  - Municipal, commercial, construction
  - Monitoring, outreach
  - New & Redevelopment
  - Pollutants of concern

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The Municipal Regional Permit

- Mercury/PCB reduction requirements
- Trash reduction requirements
- New & Redevelopment controls
- Green Infrastructure Plans
  - Show gradual transformation from “grey to green”
  - Achieve specific mercury/PCB reductions by 2040
  - Each local agency must adopt by 2019

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Big Picture

- Very challenging and costly problems
- Also facing drought, floods, & climate change
- Can drainage systems be more sustainable?
- Can rainfall be a resource and not a waste?

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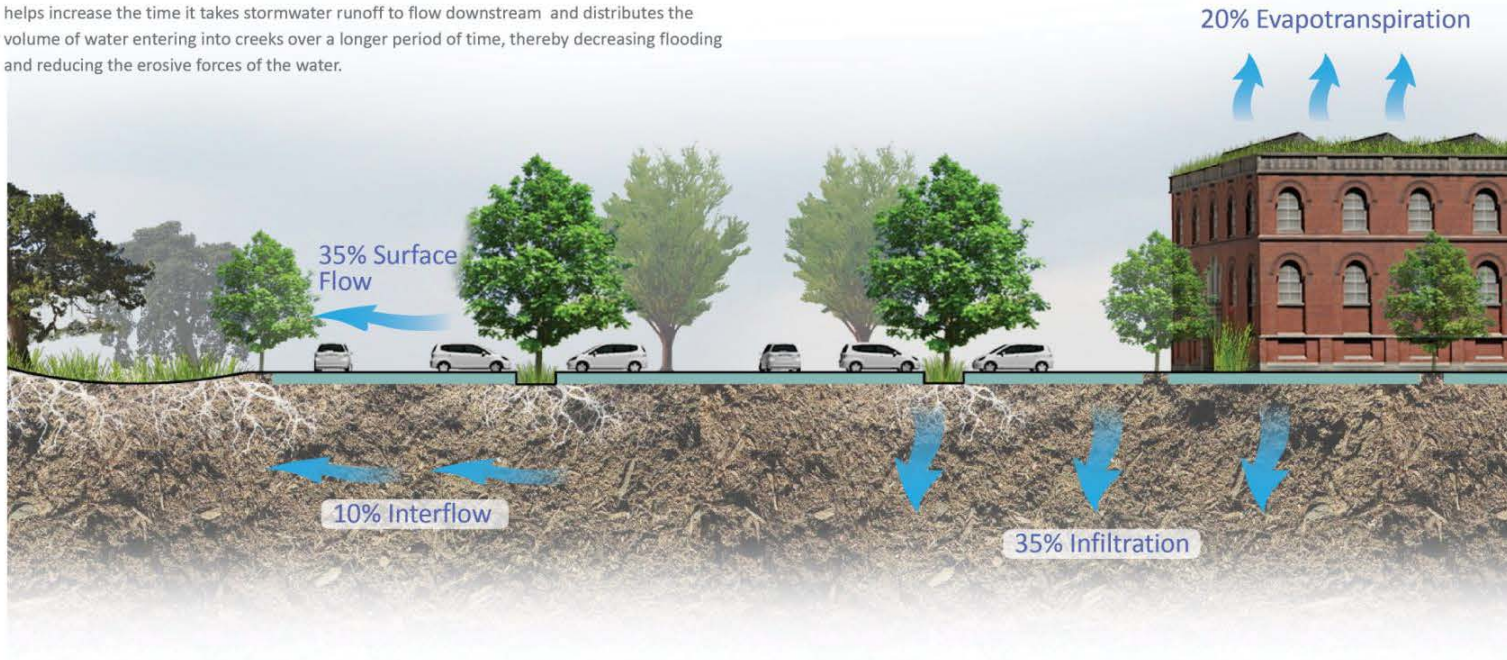
1.4 Balanced Development

A Greener Approach

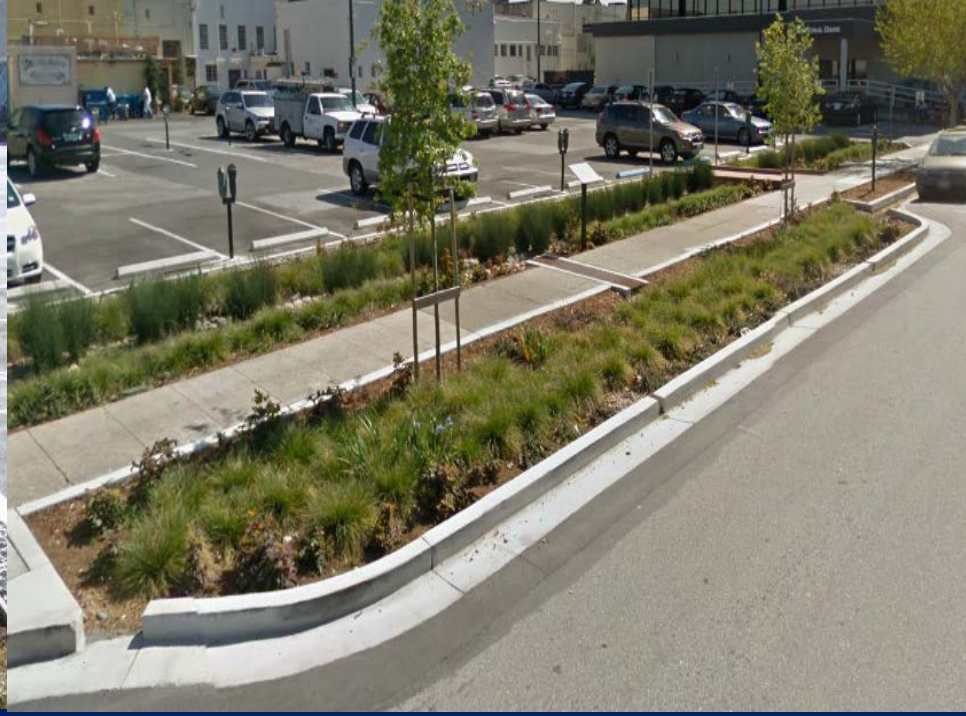
Infrastructure can be designed to minimize its impact on natural drainage systems. Our streets and parking lots can help maintain the balance of natural drainage systems by capturing, slowing, and absorbing stormwater, as well as filtering the pollutants that urban development introduces. Green infrastructure such as green streets, green parking lots, and green roofs helps increase the time it takes stormwater runoff to flow downstream and distributes the volume of water entering into creeks over a longer period of time, thereby decreasing flooding and reducing the erosive forces of the water.



Rain Garden
Brisbane City Hall

Rain Gardens
Serramonte Library
Daly City

Stormwater Curb Extension
City of San Bruno



Rain Garden & Curb Extension
Donnelly Avenue
City of Burlingame

Stormwater Resource Plan (SRP)

- Senate Bill 985 (2014, Pavley) requires Stormwater Resource Plans in order to receive grants for stormwater capture projects
- Separate from Municipal Regional Permit, but related
- Goal is to better utilize rainfall as a resource to address water supply, flood, and quality concerns
- State Water Board issued SRP guidelines in late 2015
- C/CAG initiated countywide SRP in March 2016, Board adopted final in February 2017

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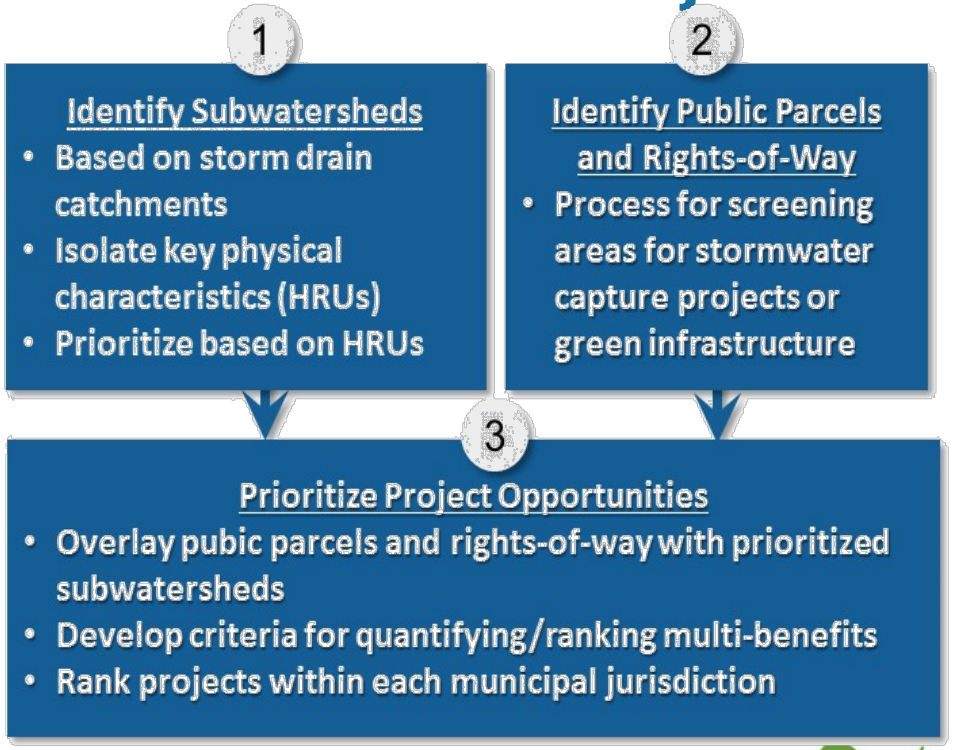
Identify and Prioritize Stormwater Projects

- GIS screening of public parcels and rights-of-way
- Prioritization based on:
  - Maximum effectiveness for stormwater control
  - Multiple benefits (groundwater recharge, reuse, enhancement of habitat or open space)



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San Mateo County Project Prioritization

English

Info and Tools

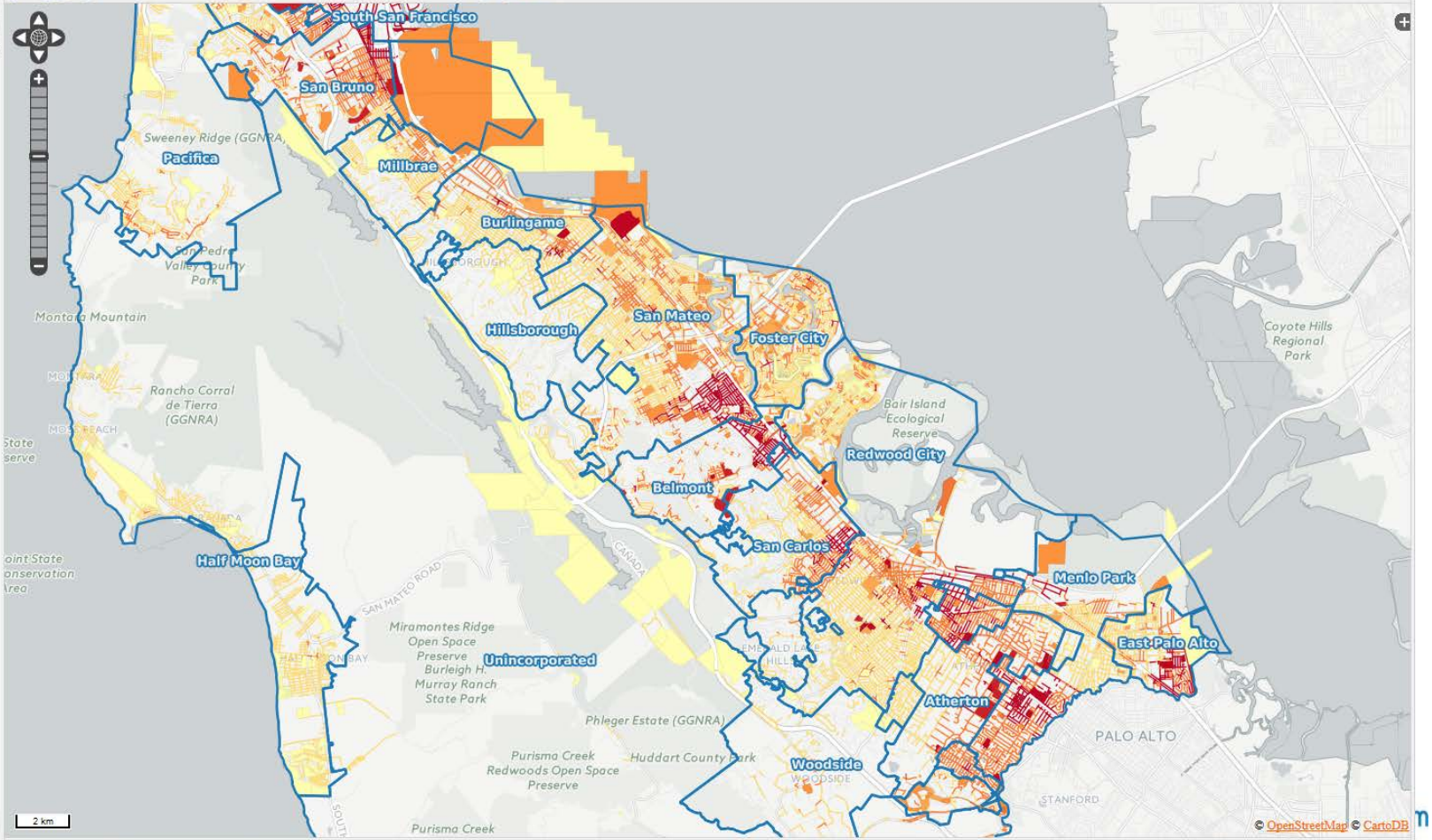
Map

Map Layers

- San Mateo County Project Prioritizati
  - Jurisdiction
  - Regional Projects prioritized
  - LID Projects prioritized
  - Green Streets prioritized
- Background Layers
  - Light Theme (CartoDB)
  - Dark Theme (CartoDB)
  - Open Street Map
  - Google Satellite
  - Google Map

Layer order

Object identification: Active Layer



Mode: navigation. Shift/rectangle or mouse wheel for zooming.

Coordinate: -13605540,4527935 1: 144448

Project Concepts

- C/CAG developed 22 project concepts for its member agencies
- Combination of regional, green street, and onsite projects
- Intent is to support funding proposals

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Stormwater Grants

- State Water Board stormwater grant program (Prop 1)
  - Redwood City and San Mateo proposals
    - Five projects total: four green street, one parking lot
    - Funding for both proposals (~$1.2 million total)
  - Daly City also recommended to receive $10 million
- Caltrans cooperative implementation agreements
  - Regional stormwater capture projects
    - Atherton (Las Lomitas Elementary School, $13.6 M)
    - South San Francisco (Orange Memorial Park, $9.5 M)

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Green Infrastructure Planning

- All permittees to develop GI Plans by 2019
- Describe gradual shift from gray to green
- Includes public and private
- Show 3 kg/yr PCBs load reduction by 2040
- Prioritize projects within specific time frames
- Design guidelines, details, and standard specs
- Adopt relevant policies & ordinances
- Public outreach, staff training, educate electeds

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Reasonable Assurance Analysis

- Modeling effort to show collective implementation of GI plans will meet goals
  - Hydrologic/hydraulic and pollutant transport
  - GI scenarios for achieving load reduction
- Includes projections for private development through 2040
- Will establish how much “public” GI is needed to achieve load reductions

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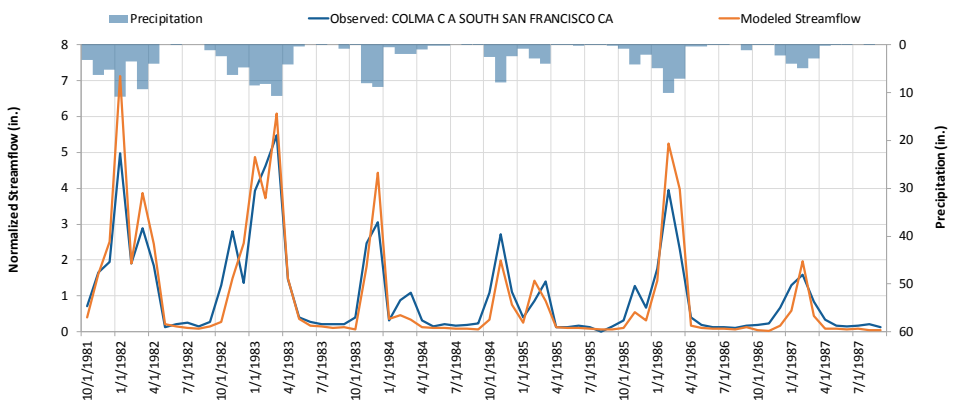
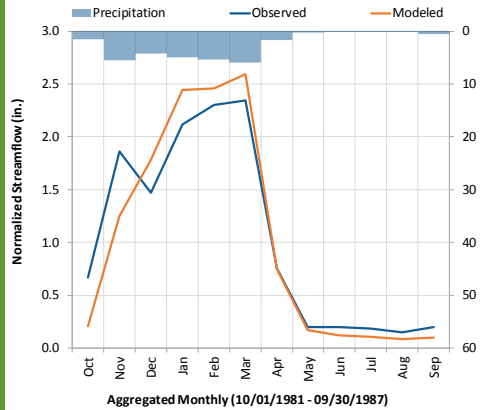
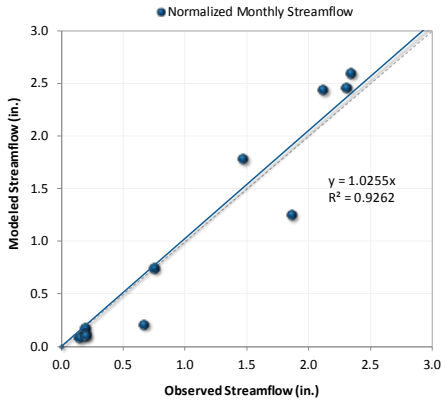
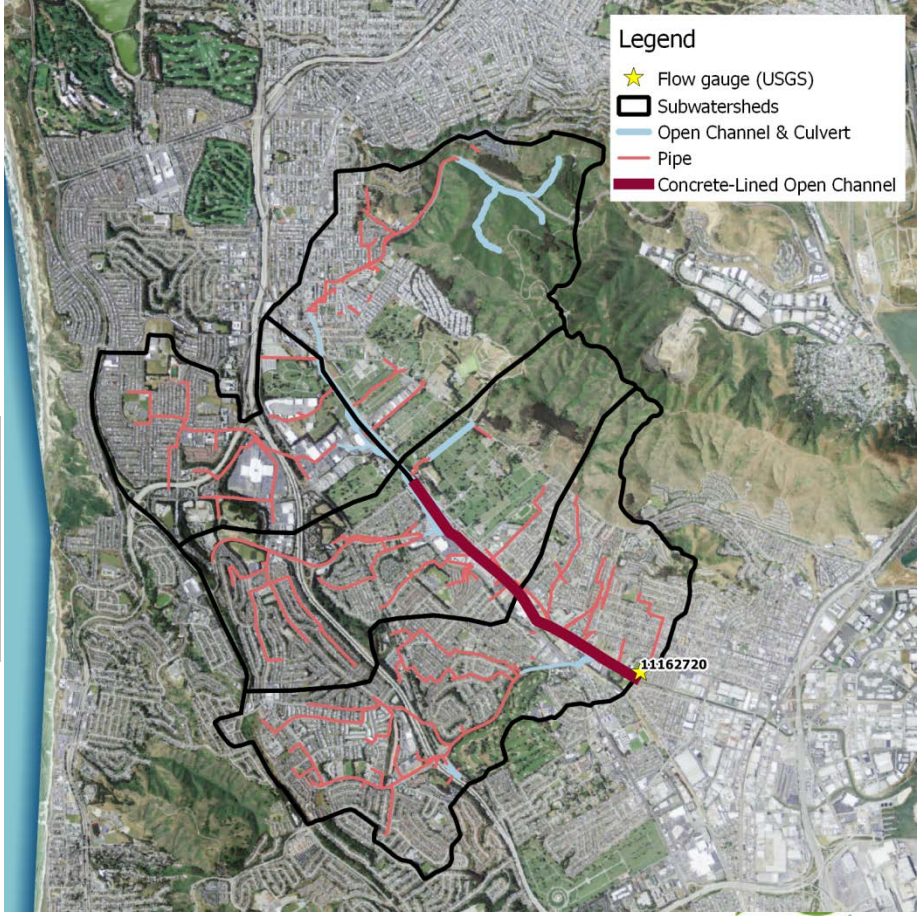


Calibration Metrics (10/01/1981 - 09/30/1987)	Relative Mean Error	Recommended Error Criteria			
		Very Good	Good	Fair	Poor
Total Annual Volume	-3.1%	≤ 5%	5 - 10%	10 - 15%	>15%
Highest 10% of Flows	-0.7%	≤ 10%	10 - 15%	15 - 25%	>25%
Lowest 50% of Flows	6.0%	≤ 10%	10 - 15%	15 - 25%	>25%
Annual Storm Volume	0.6%	≤ 10%	10 - 15%	15 - 25%	>25%







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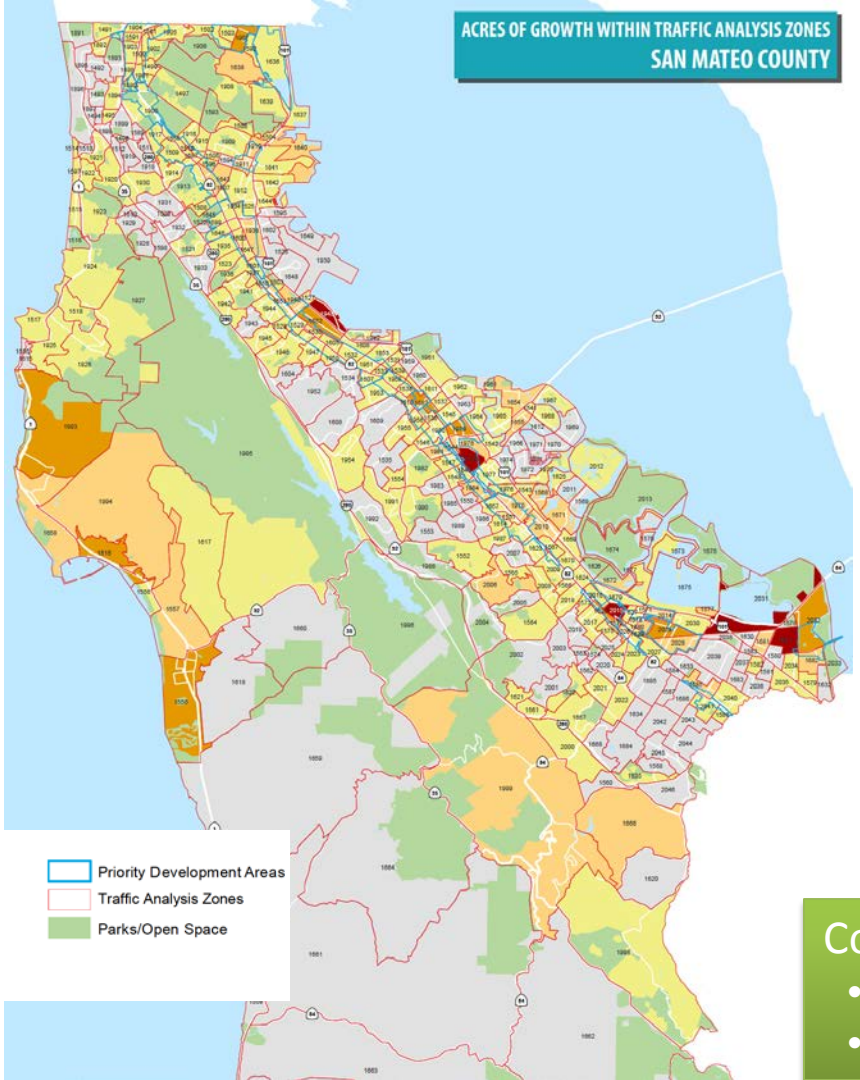

Revised Results

- Land Area needed for 2040 projected growth

Land Use	Acres
Single-family homes	296 (+28)
Multi-family homes	510 (+55)
Work places	1021 (+322)
Total Land Area	1,827(+387)

County Urban Land Area

- 45,820 acres RAA est. existing
- 1,827 acres by 2040 is 4.0% increase

Collaboration Thoughts

- Multi-benefit nature of green infrastructure
  - Flood control, groundwater, heat islands, etc.
- Calibrated, countywide hydrology model
- Projections of new/redevelopment
- How will climate change impact precipitation?
- GI plans will only address water quality goals
- Plan updates to incorporate GI
- Public outreach and education
- Funding needs are significant

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