BARC.

Municipal Regional Stormwater NPDES Permit: Reissuance and Resilient Green Infrastructure

January 15, 2021

Keith Lichten
SF Bay Regional Water Quality Control Board

Overview

- Background and schedule
- Key issues
  - COVID-19
  - Trash
  - New and redevelopment
- Key tool: Resilient green infrastructure

MRP Background

- MRP covers 79 permittees
- First stormwater permits issued early 1990s
- MRP 1 adopted 2009
- MRP 2 adopted 2015

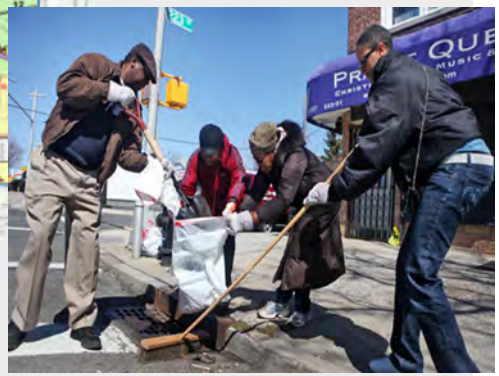
MRP Reissuance
A Collaborative Stakeholder Process

Steering Committee & Workgroups

- Meetings started late 2018/early 2019

Upcoming Schedule

- Early 2021: administrative draft for informal comment
- Summer 2021
  - Public draft for formal comment
  - Board testimony hearings
- Late 2021: Board adoption hearing
- July 1, 2022: Target effective date of reissued permit.



Key issues

- COVID-19 impacts
- Trash, PCBs, homelessness
- New and redevelopment
- Key tool: Resilient green infrastructure

New and Redevelopment

- Green Infrastructure Plans – *implement plans*
  - *"Greened acres" requirement*
- Low Impact Development design – continues
- "Regulated projects"
  - *5,000 square feet* of impervious surface
  - Special Projects – *reduce scope*
  - Revised expectations for large roads projects and large single-family homes
- Alternative compliance – *recognize grant-funded project*

Opportunity: Resilient Green Infrastructure Multi-benefit implementation

A GUIDE TO EATING FISH *from* SAN FRANCISCO BAY

(ALAMEDA, CONTRA COSTA, MARIN, NAPA, SAN FRANCISCO, SAN MATEO, SANTA CLARA, SOLANO, SONOMA COUNTIES)

WOMEN 18 - 45 YEARS AND CHILDREN 1 - 17 YEARS

Eat the Good Fish
Eating fish that are low in chemicals may provide health benefits to children and adults.

Avoid the Bad Fish
Eating fish with higher levels of chemicals like mercury or PCBs may cause health problems in children and adults.

Choose the Right Fish
Chemicals may be more harmful to unborn babies and children.

Women (18-45 Years)

Children (1-17 Years)

2 TOTAL SERVINGS A WEEK

OR

1 TOTAL SERVING A WEEK

0 DO NOT EAT

Brown rockfish

Chinook (King) Salmon

high in omega-3s

Jacksmelt

Red rock crab

California halibut

White croaker

Sharks

White sturgeon

Surfperches

Striped Bass

Serving Size
A serving of fish is about the size and thickness of your hand. Give children smaller servings.

For Adults

For Children

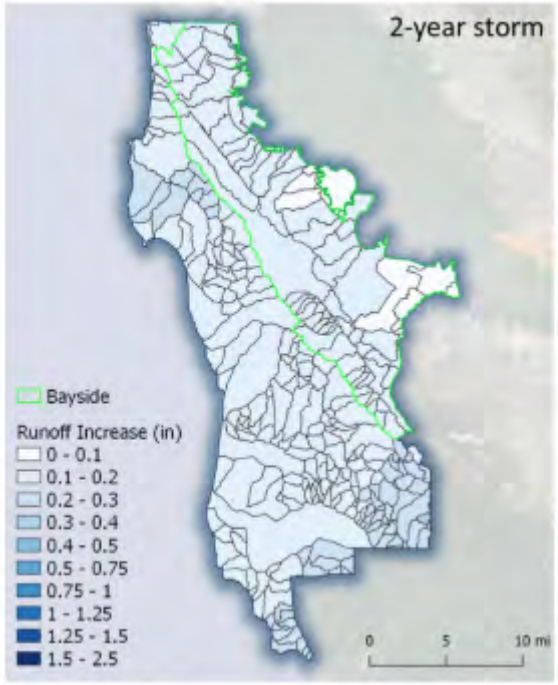
Some chemicals are higher in the skin, fat, and guts

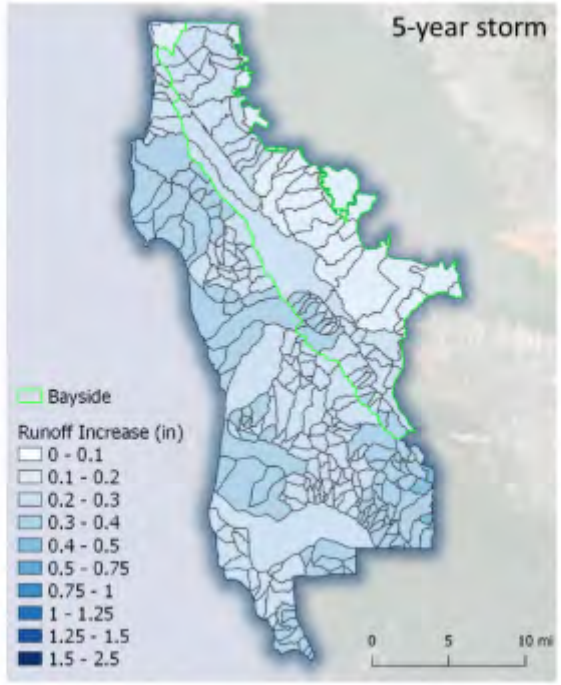
Eat only the skinless fillet

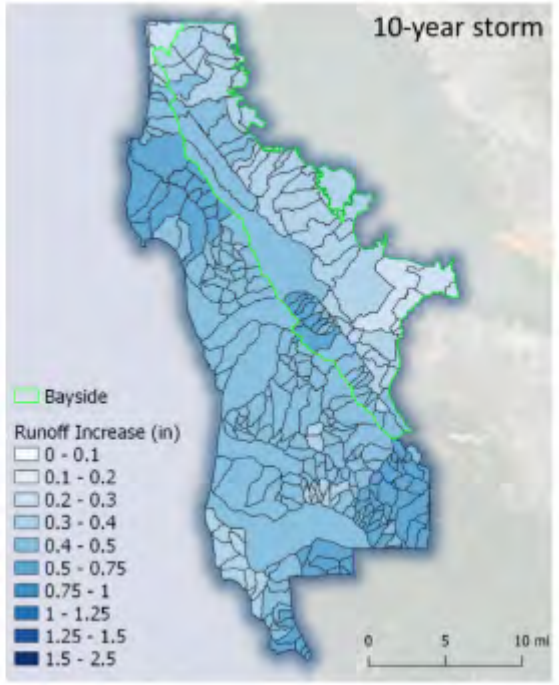
Eat only the meat

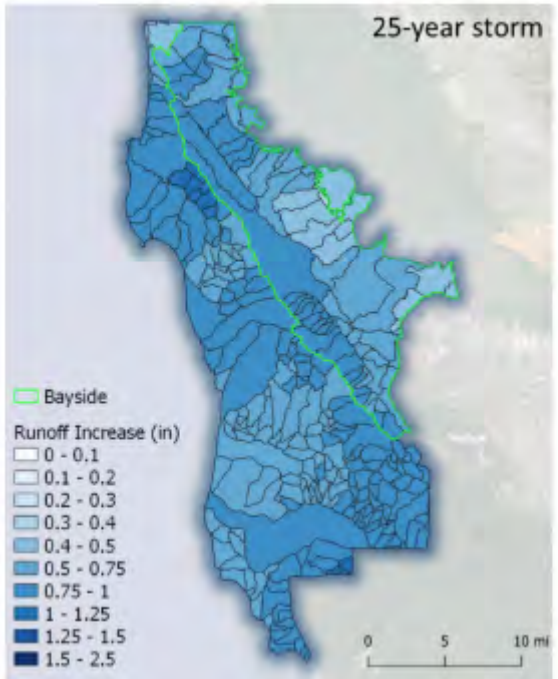
California Office of Environmental Health Hazard Assesment

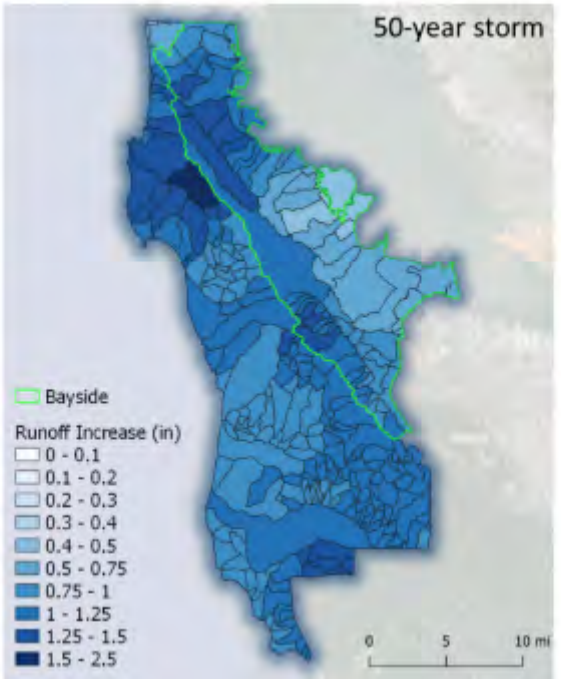
web www.oehha.ca.gov/fish
email fish@oehha.ca.gov
phone (916) 324-7572

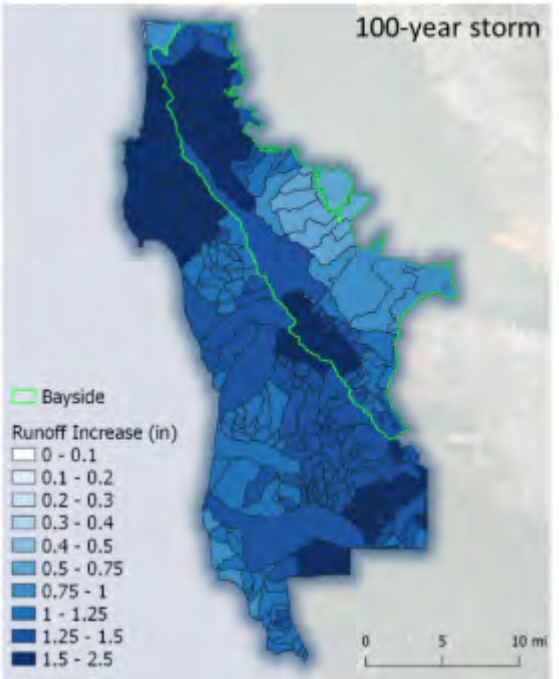

2-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


5-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


10-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


25-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


50-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


100-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi

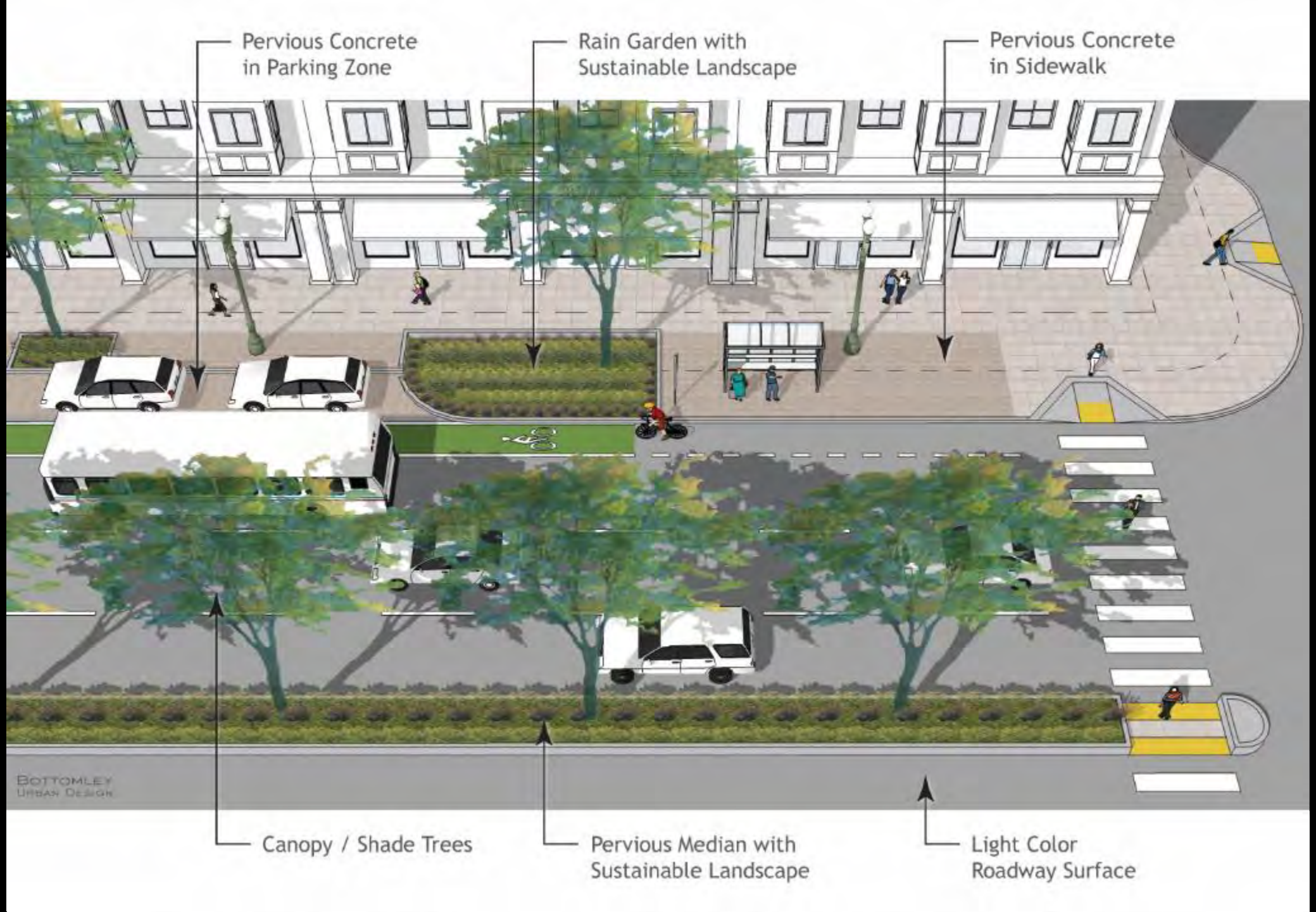
Multi-Scale Stormwater Management

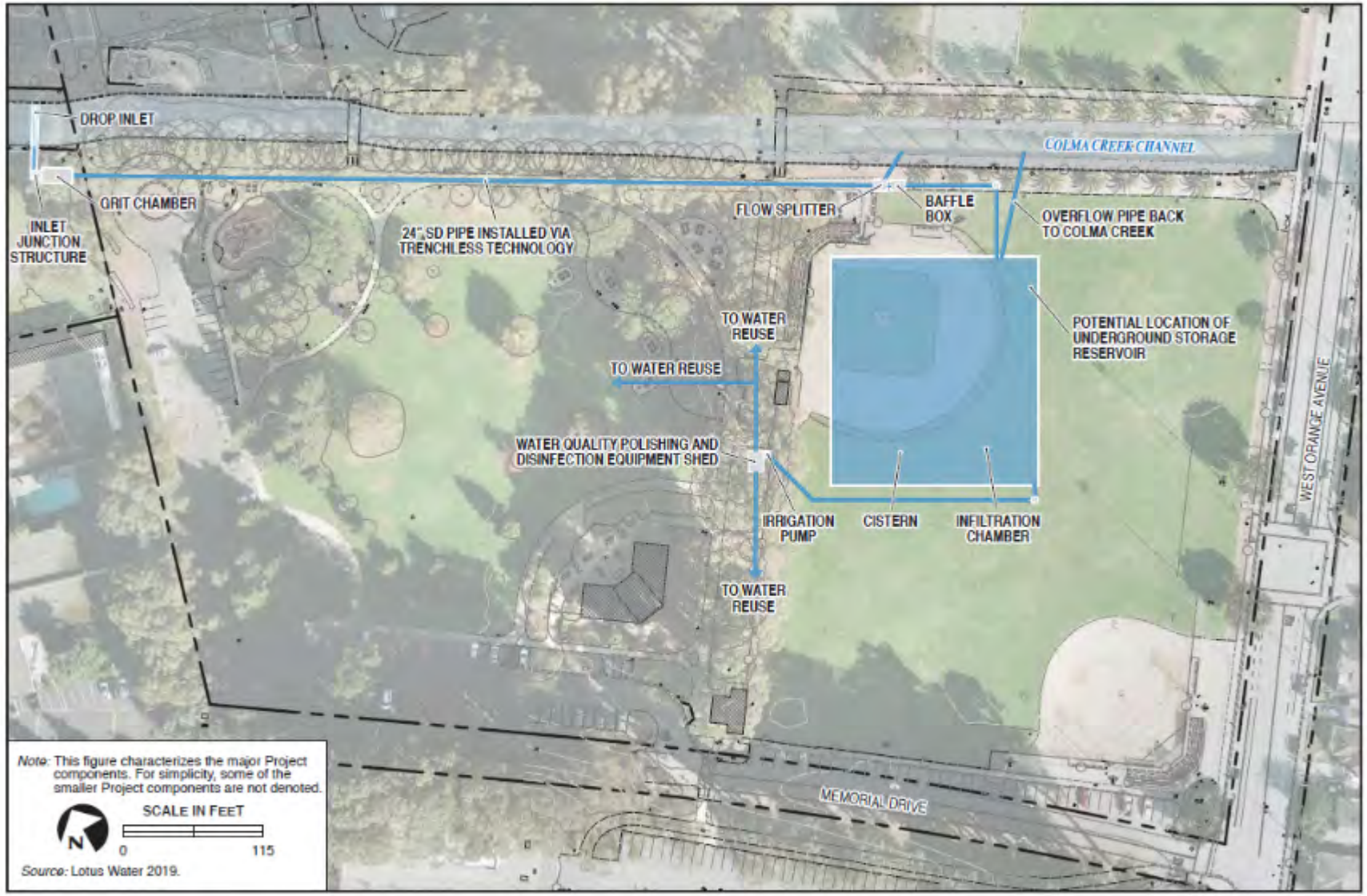
Parcel

Street

Regional

Rain Garden
Brisbane City Hall


Pervious Concrete
in Parking Zone
Rain Garden with
Sustainable Landscape
Pervious Concrete
in Sidewalk
Canopy / Shade Trees
Pervious Median with
Sustainable Landscape
Light Color
Roadway Surface
BOTTOMLEY
URBAN DESIGN



wood.

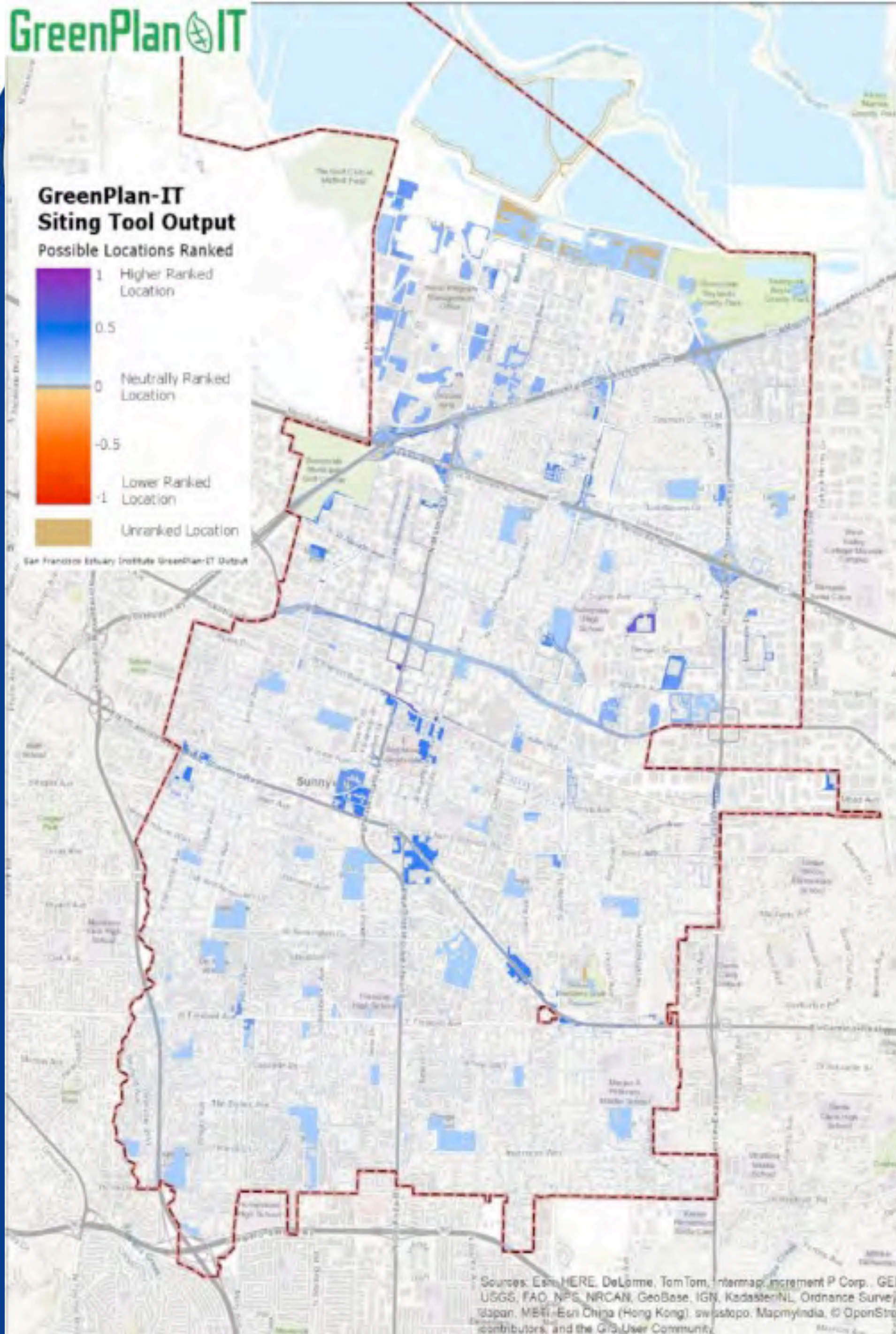
Project Details

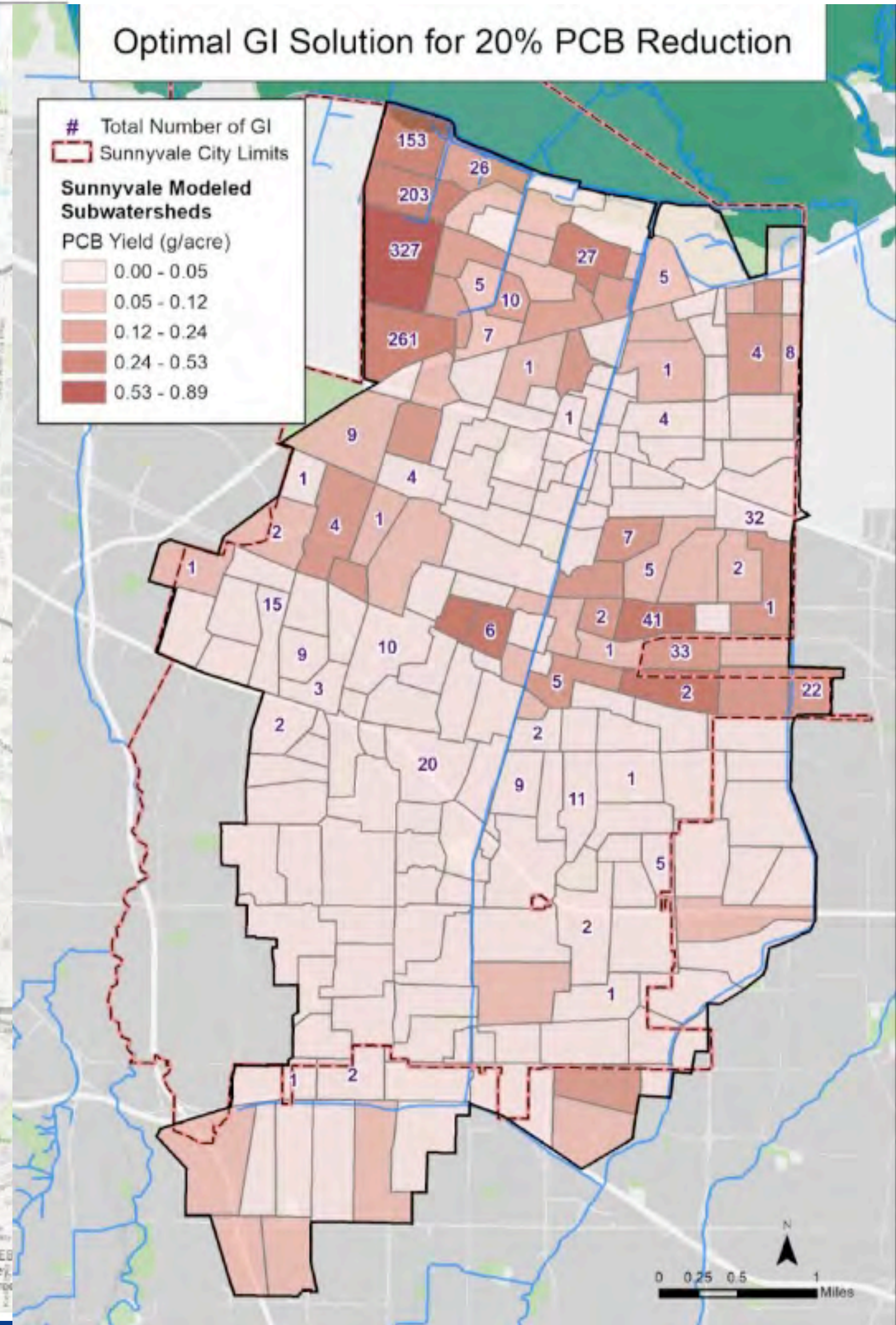
FIGURE 2

How do we work together to collaboratively manage stormwater?

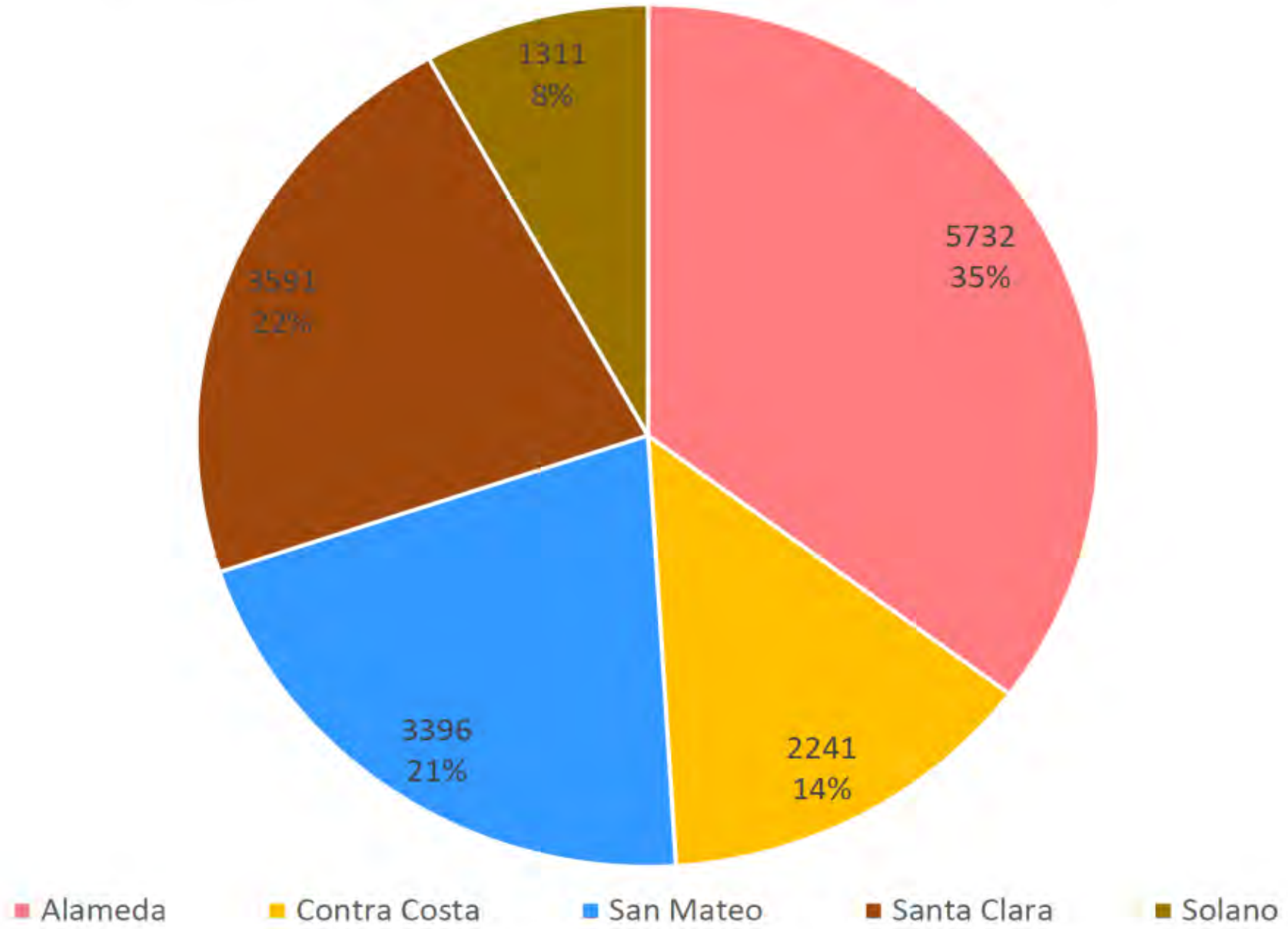
- Improve Water Quality
- Reduce Runoff Volumes
- Improve Pedestrian Safety & Experience
- Reduce Heat Islands
- Improve Street Aesthetics
- Increase Public Awareness of Stormwater

GREEN STORMWATER INFRASTRUCTURE BENEFITS


GreenPlan-IT
GreenPlan-IT Siting Tool Output
Possible Locations Ranked
1 Higher Ranked Location
0.5
0 Neutrally Ranked Location
-0.5
-1 Lower Ranked Location
Unranked Location
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Optimal GI Solution for 20% PCB Reduction
Total Number of GI
Sunnyvale City Limits
Sunnyvale Modeled Subwatersheds
PCB Yield (g/acre)
0.00 - 0.05
0.05 - 0.12
0.12 - 0.24
0.24 - 0.53
0.53 - 0.89
0 0.25 0.5 1 Miles

Proposed Impervious Area Treated (acres) by 2040, by County



Challenges for Widespread GSI Implementation

- Personnel and agency inexperience
- Costly as a standalone retrofit project
- Funding and capacity constraints
- Physical space and drainage constraints:
  - Water Quality credit sizing requirements
  - Utility information, coordination, relocation
- Multiple jurisdictions, stakeholders, and risks in public right-of-way
- How is progress tracked regionally?

Berkeley Site Rendering


TURN
ONLY
GILMAN AUTO
527-5226
FOREIGN DOMESTIC

36″

22″

GREEN STREETS

BLUE BAY

GREEN STREETS CLEAN POLLUTED WATER BEFORE IT DRAINS TO THE BAY

WHAT ARE GREEN STREETS?

When it rains, stormwater races off roof tops, sidewalks, and streets, picking up pollutants such as motor oil, heavy metals, pesticides, trash, and pet waste. The contaminated water typically flows untreated into storm drains, creeks, and ultimately into the San Francisco Bay.

Green Streets **collect** stormwater in specially designed basins, filled with carefully selected plants and soils. The plants and soil organisms **clean** the water by filtering and breaking down various pollutants. The cleansed stormwater **returns** to the storm drain system or soaks into the native soil (replenishing groundwater).

In addition to cleaning the water, Green Streets beautify the community, provide bird and insect habitat, and reduce localized flooding.

¿CUÁLES SON LAS CALLES VERDE?

Cuando llueve, las carreras de aguas pluviales fuera tejados, aceras y calles recogiendo contaminantes, tales como: aceite de motor, metales pesados, pesticidas, basura y desechos de mascotas. Esta agua contaminada normalmente fluye sin tratar en las alcantarillas, arroyos, y en última instancia en San Francisco Bay.

Calles Verdes **recoger** las aguas pluviales en las cuencas diseñadas especialmente llenos de plantas y suelos cuidadosamente seleccionadas. Las plantas y los organismos del suelo **limpian** el agua por filtración y romper varios contaminantes. El agua de lluvia limpia **vuelve** al sistema colector de aguas pluviales o empapa en los suelos naturales (agua subterráneas reposición).

Además de limpiar el agua, las Calles Verdes embellecer la comunidad, proveen hábitat de aves y de insectos, y reducir inundaciones localizadas.

EMERYVILLE GREEN STREET WATERSHED

Stormwater from the shaded 2 acre area indicated on the map is filtered and cleaned by this Green Street.

BEFORE THE GREEN STREET

ESTUARY PARTNERSHIP

STOPWASTE

OAKLAND

Next Generation Urban Greening

Robin Grossinger

Urban Nature Lab
San Francisco Estuary Institute

January 15, 2021

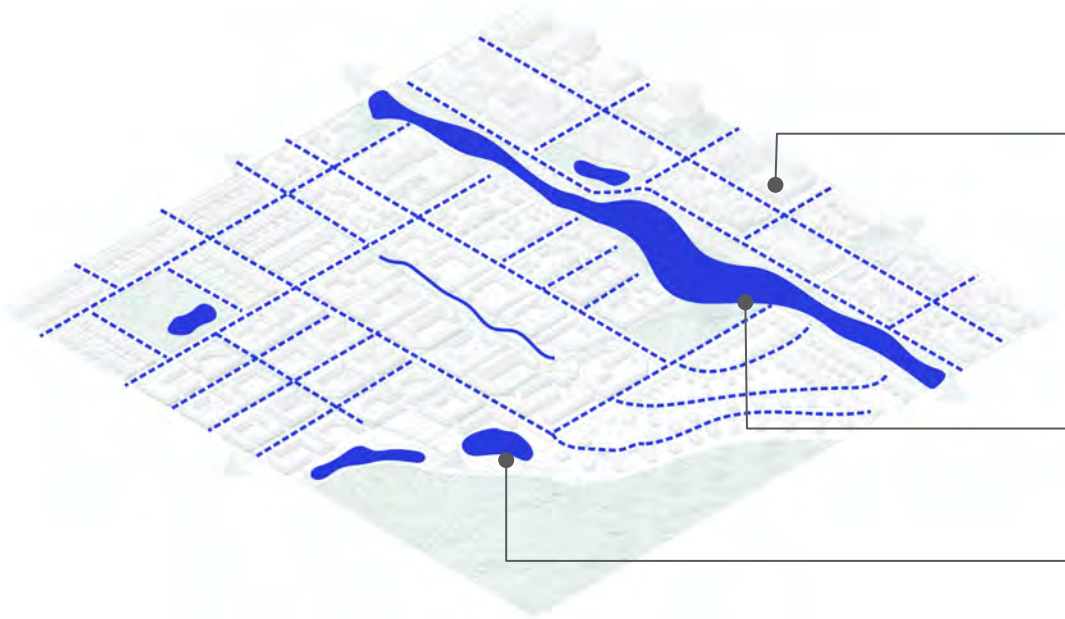
SFEI AQUATIC SCIENCE CENTER
SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER

In the future, our green infrastructure will need to do more:

- Clean stormwater and flood protection
- Urban heat mitigation
- Health and well-being
- Equitable access to nature

Networks of GI to support these critical functions across the urban landscape

Benefit: **Stormwater Management**

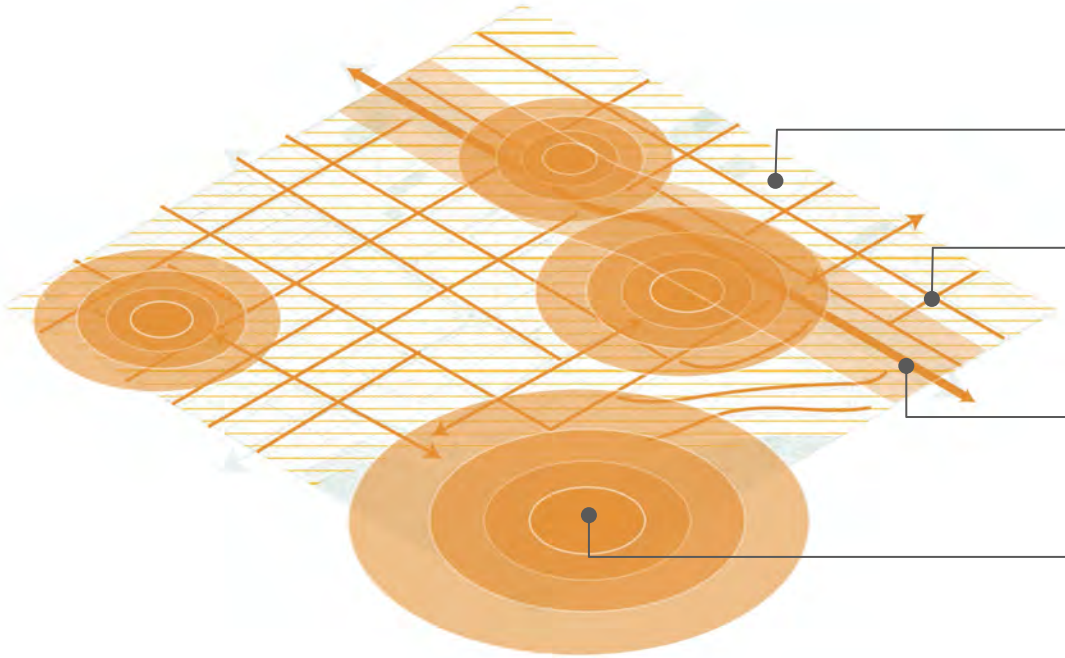


Street-Level Bioretention
Intercept, infiltrate, & slow runoff at the point of generation

River & Floodplain Restoration
Reduce flood risk

Stormwater Basins
Capture & treat runoff, reduce peak flows

Benefit: **Heat Mitigation**



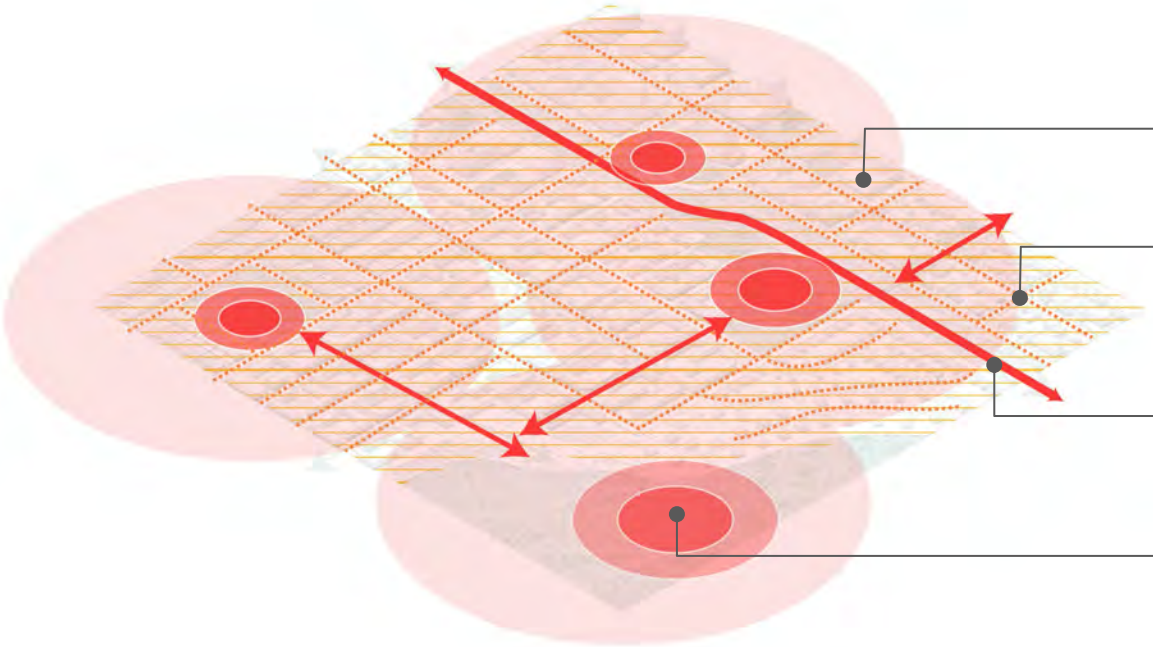
Tree Canopy Cover
Neighborhood cooling

Green Streets
Shaded corridors for active mobility

Waterways
Cool corridors & local cooling

Park Cool Islands
Heat refugia & neighborhood cooling

Benefit: **Health**



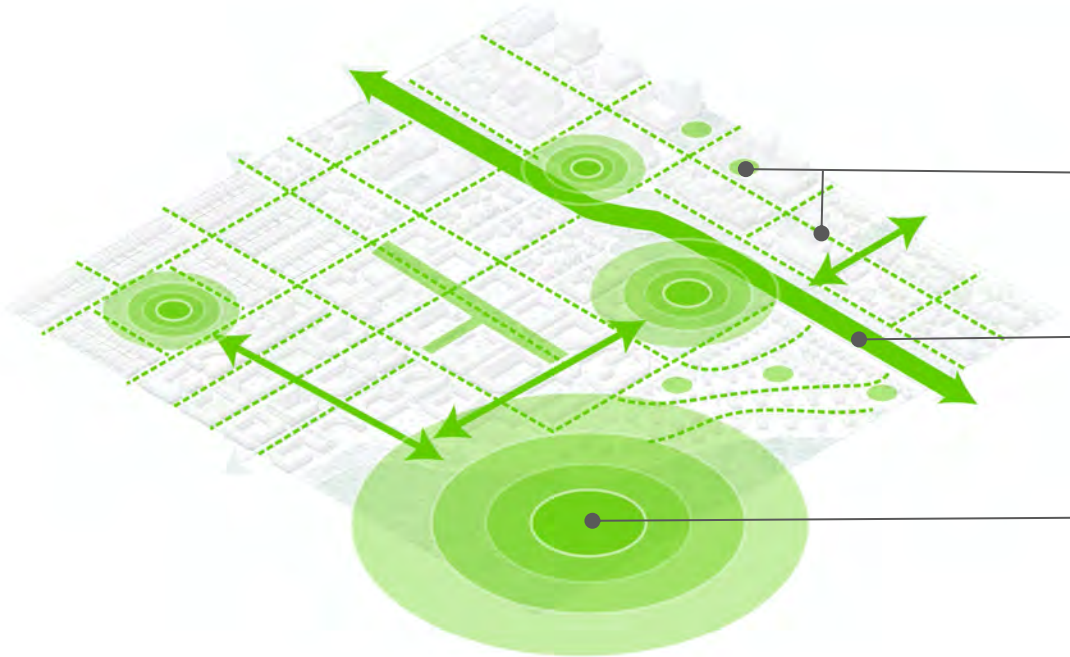
Greenness
Improved physical & mental health outcomes

Green Streets
Physical activity, active transit, & local pollution reduction

Water Features
Attention restoration & aesthetic value

Parks
Nature immersion, personal restoration & physical activity

Benefit: **Biodiversity**



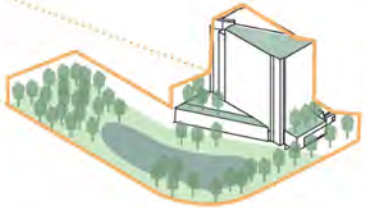
Matrix Quality
Wildlife mobility & increased effective size

Connections
Wildlife movement & gene flow

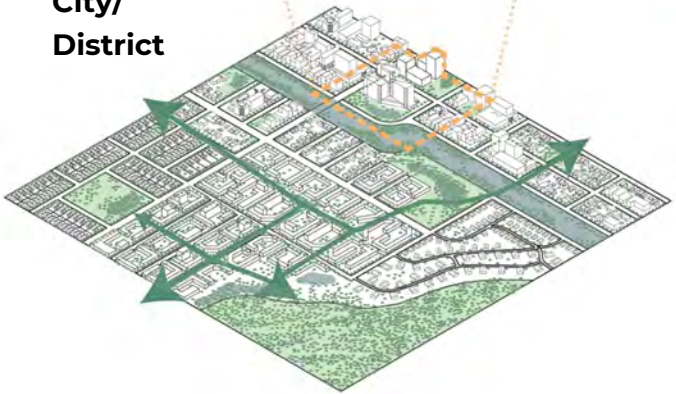
Patches
More species & larger populations

Block

Street



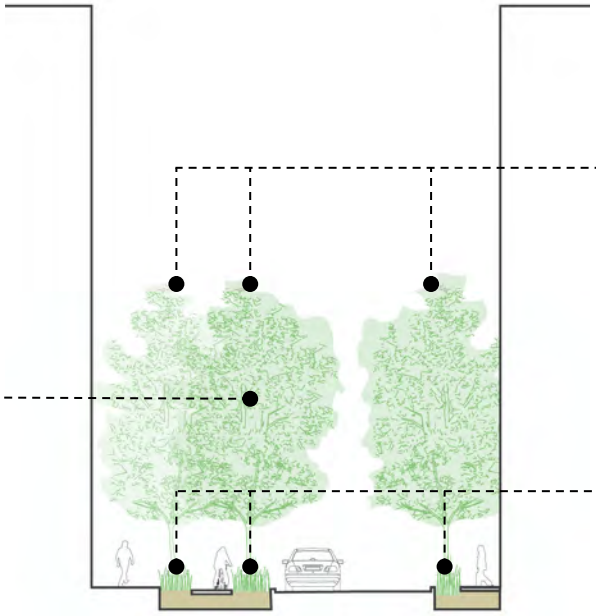
City/ District



Parcel

Feature

Example Guidance for a Model Resilient Street



Tree Placement
-Continuous canopy (75% target)
-Gaps <100 ft
-Trees on both sides of street

Tree Selection
-Mix of large and small trees
-Dense canopies
-Avoid trees that produce high volumes of allergenic pollen
-Prioritize native species

Understory Vegetation
-Shrubs between road and bike path
-Flowering plants for pollinators and aesthetic enjoyment
-Buffer wide enough for canopy trees

Landscape Area
-At least 100 ft^2 plantable surface area per tree
-At least 1,000 ft^3 rooting volume per tree

Next Generation Urban Greening

EPA WQIF-Funded Project
2020 - 2024

Partners and Participants

- US EPA San Francisco Bay Water Quality Improvement Fund
- SF Bay Regional Water Quality Control Board

City of San Francisco

- SF Public Utilities Commission
- SF Rec and Parks Department
- SF Department of the Environment
- SF Public Works

MRP Stormwater Programs

- Oakland Watershed and Stormwater Management Division
- Santa Clara Valley Urban Runoff Pollution Prevention Program
- San Mateo Countywide Water Pollution Prevention Program

Other

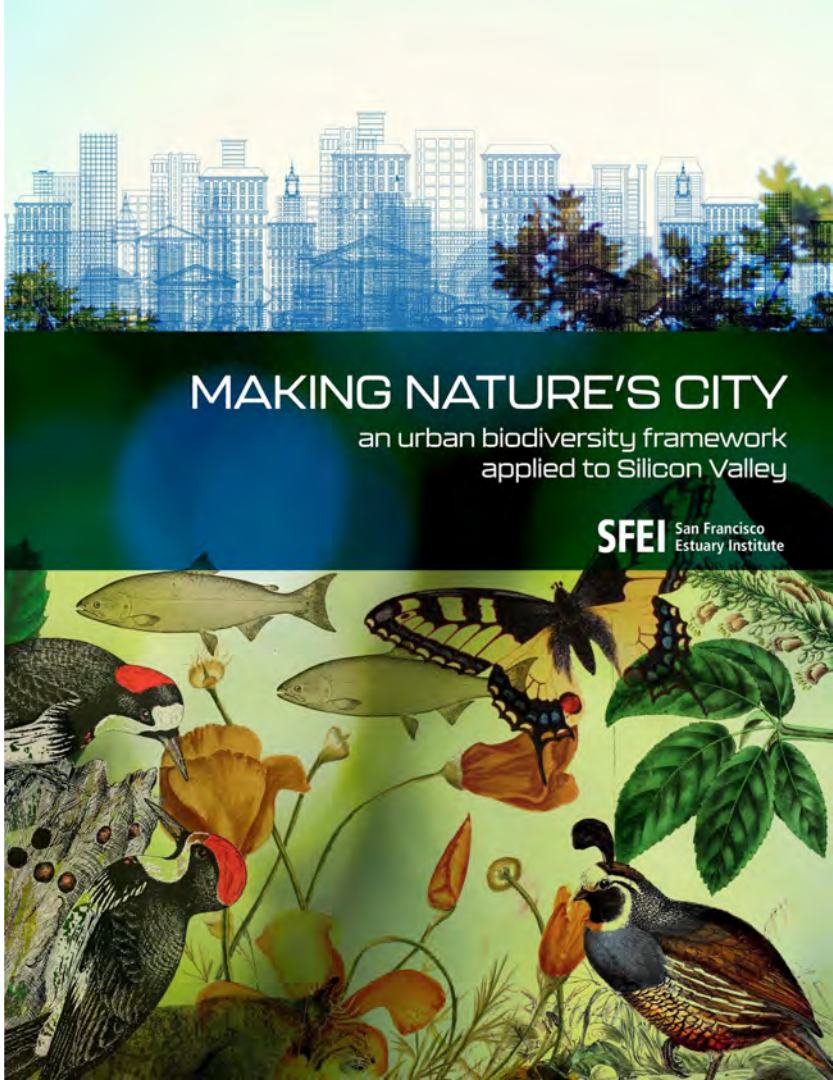
- Visitacion Valley Greenway
- CNPS - Yerba Buena
- Golden Gate Audubon Society
- SF Bay Regional Monitoring Program
- State Coastal Conservancy
- Ocean Protection Council
- SPUR
- Univ. of Washington, Center for Urban Waters
- University of Toronto
- Google Ecology Program

Building on

- Urban Biodiversity Framework
- Integrated Nature Design Guidance
- GreenPlan-IT
- Microplastics research

GreenPlan-IT

USEPA, Google Ecology Program, Robert Wood Johnson Foundation, Bay RMP

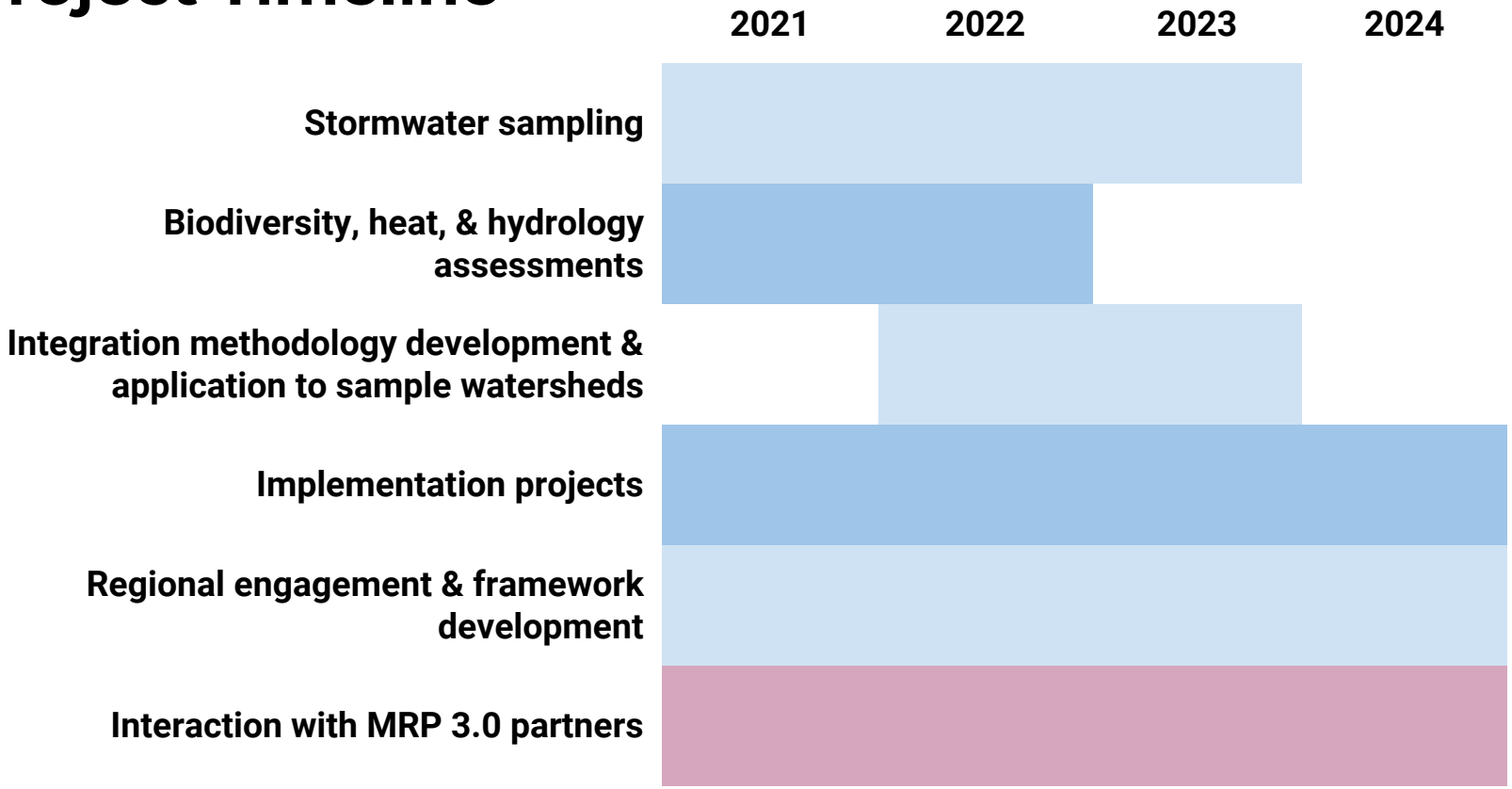


Key Products

- **Methodology for multi-benefit Resilient GI planning** in the San Francisco Bay Area
- Model Next Generation Urban Greening **Watershed Strategy**
- New tech guidance for **GSI removal of microplastics** and emerging contaminants
- Demonstration **implementation projects**

Tanner Springs Park
Portland, OR

Project Timeline



THANK YOU

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