

An aerial photograph of a coastal city, likely San Francisco, with a blue overlay on the left side. The city's grid pattern and buildings are visible, along with the coastline and a large body of water.

# Rebuilding Soils for Effective Nature-based Solutions

Scientific Studies Program

TreePeople with UC Riverside and University of British Columbia

Ariel Whitson



# Study Overview

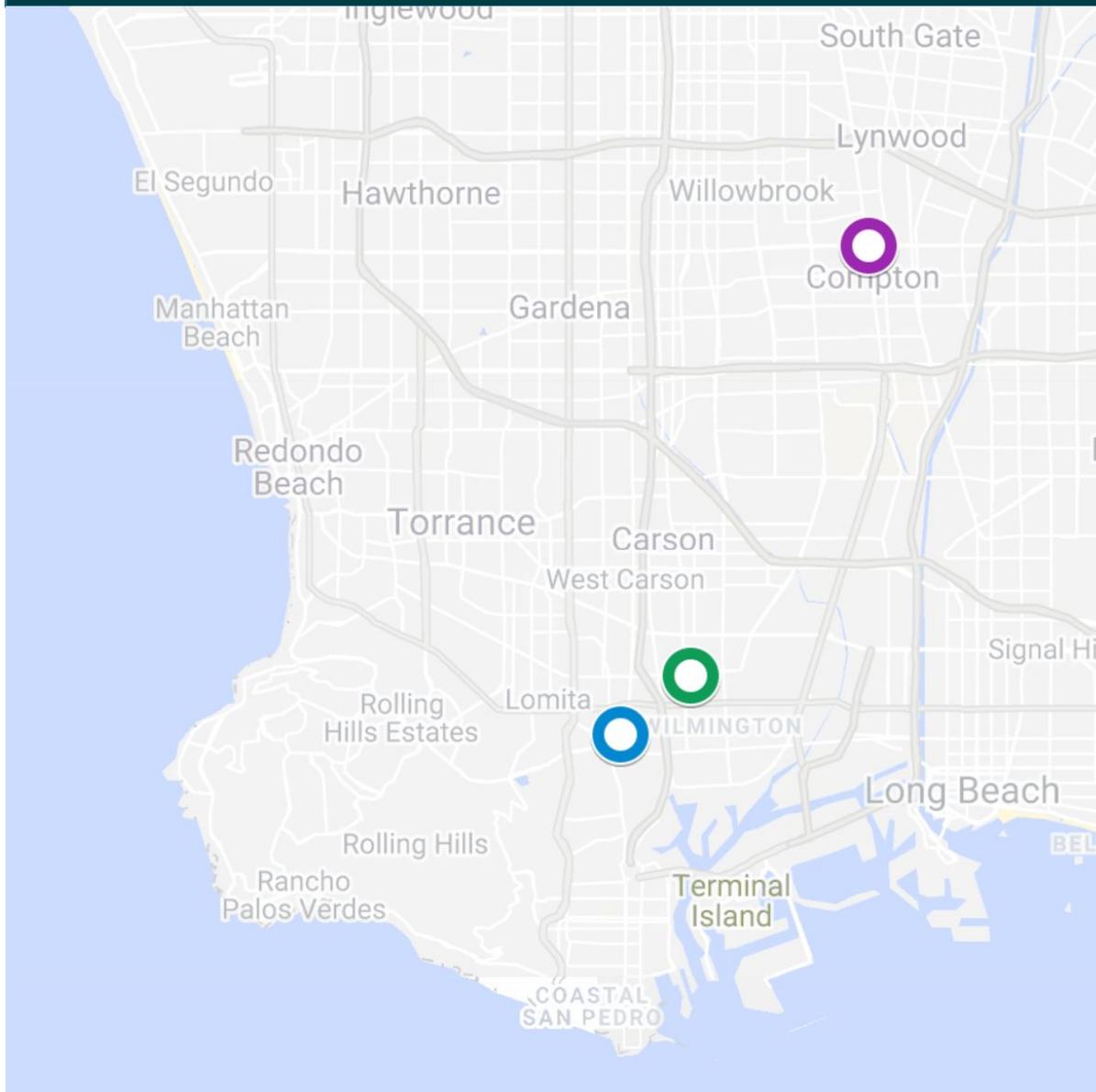
This study explores rehabilitating compacted soils using soil profile rebuilding to restore permeability as a nature-based solution (NBS) to stormwater management.

This study seeks to expand NBS across more stormwater infrastructure projects to locations where existing soil conditions preclude their use. Through the increased use of NBS in stormwater projects, because of this study's soil techniques, stormwater will be mitigated, urban runoff will be reduced, and local water supply will be increased.





# Study Location



## 3 Pilot Sites

-  Ken Malloy Harbor Regional Park, City of LA Department of Recreation and Parks
-  Wilmington Middle School, Los Angeles Unified School District
-  West Rancho Dominguez, Green Streets Project, LA County Public Works



# Study Details: Problem Statement

## NBS BARRIERS

Many urban sites are not suitable for NBS because of poor soil conditions.

## HIGH COST

Conventional stormwater management is expensive.

## INNOVATIVE SOLUTIONS

**Soil Profile Rebuilding** is a cost-effective technique to rehabilitate compacted urban soil on site. It has been adopted in Arlington, VA's stormwater requirements for land disturbing activities.



# Study Details: Objectives and Outcomes

Is urban soil rehabilitation an effective means to expand opportunities for nature-based solutions for stormwater management in Los Angeles County?

## 1. Stormwater Impact

Analyze comprehensive site data demonstrating level of success at increasing permeability rates

## 2. Demonstration Sites

Establish three proposed demonstration sites in three different land use types: parks, streets, and schools

## 3. Evaluation

Evaluate the effectiveness of soil profile rebuilding to enable NBS for stormwater management in Los Angeles County



# Study Details: Tasks

## Background Research and Project Setup

- Comprehensive literature review
- Project site installation

## Data Collection and Modeling

- Field experiment and *in situ* data collection
- Laboratory analysis and measurements
- Computer modeling with HYDRUS

## Monitoring, Reporting and Dissemination

- Recommendations for Los Angeles County
- Data analysis reports
- Technical presentations to stakeholders



# Study Details: Regional Collaboration

- LAUSD MOU
- California Ocean Protection Council \$2.3M for Wilmington Middle School and Community Green Infrastructure Project
- LA County Public Works Green Streets Project
- Dominguez Channel Watershed Management Group,
- Manhattan Beach EWMP,
- Hawthorne EWMP,
- Rancho Palos Verdes EWMP, and
- Stormwater Capture Master Plan



# Cost & Schedule

Year	Description	Cost	Completion Date
<b>1</b>	Background Research and Project Setup	\$664,667	Y1
<b>2</b>	Data Collection and Modeling	\$166,566	Y1-Y3
<b>3</b>	Monitoring, Reporting and Dissemination	\$166,565	Y2-Y3
<b>TOTAL</b>		<b>\$997,798</b>	



# Funding Request

WASC	Year 1	Year 2	Year 3	Year 4	Year 5
CSMB					
LLAR					
LSGR					
NSMB					
RH					
SCR					
SSMB	\$664,667	\$166,566	\$166,565		
ULAR					
USGR					
<b>TOTAL</b>	<b>\$651,958</b>	<b>\$291,421</b>	<b>\$166,565</b>		



# Summary of Benefits

## The Rebuilding Soils for Effective Nature-based Solutions Scientific Study will:

- **Improve water quality**
- **Increase water supply**
- **Enhance community investments in NBS**



**Questions?**



# Backup Slides



# Organizational Chart and Responsibilities

## University of California Riverside

- Technical Lead
- Manage Soil
- Characterization Efforts
- Oversee Soil
- Rehabilitation Process
- Soil Monitoring
- Reporting

## TreePeople

- Project Management
- Study Oversight
- Community Engagement
- Coordination and Reporting

## University British Columbia

- Soil Science Consulting
- and Review

## CAMP

- Experiment Installation
- Site Maintenance and Monitoring
- Research support

An aerial photograph of the Los Angeles coastline and city grid, showing the ocean on the left and the city extending inland. The image is used as a background for the title and introductory text.

# Community Garden Stormwater Capture Investigation

Scientific Studies Program

Fiscal Year 2022-2023

South Santa Monica Bay Watershed

Los Angeles Community Garden Council

Diana Campos Jimenez, Juan Diaz-Carreras



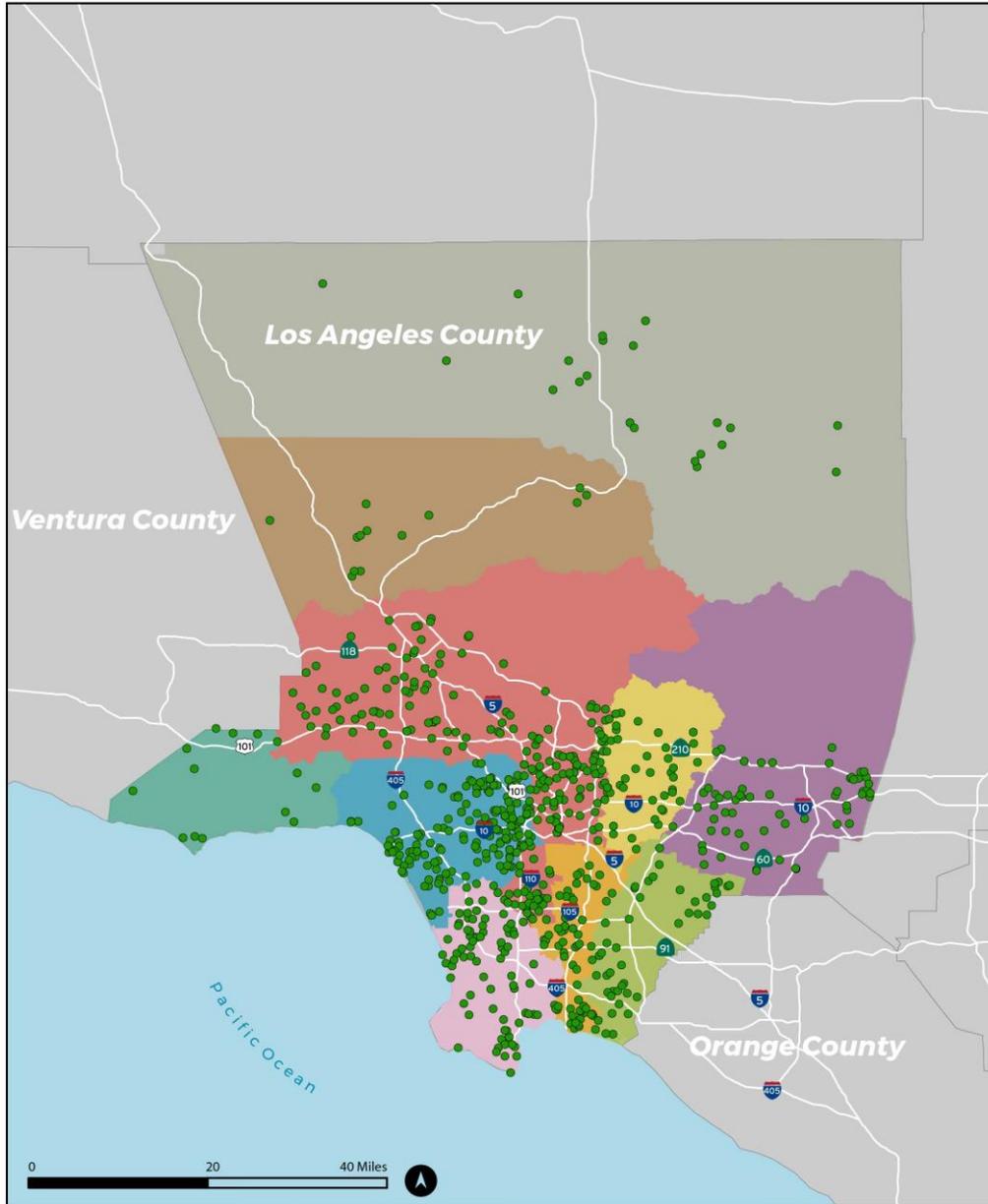
# About Us!

- A 501(c)3 non-profit organization founded in 1998
- Our mission is to strengthen communities by building and supporting community gardens where every person in Los Angeles County can grow fresh food in their neighborhood
- Manage 40+ community gardens
- Offer workshops, gardening advice, and community organizing
- Advocate for accessibility to affordable, healthy food





# SCW and Scientific Study Program Goals



- The purpose of the Scientific Studies Program is to provide funding for scientific and technical activities related to Stormwater and Urban Runoff capture and pollution reduction.
- The study will develop knowledge of the ability of community gardens to advance SCWP goals.

# Project Overview

Can community gardens function as stormwater capture facilities?

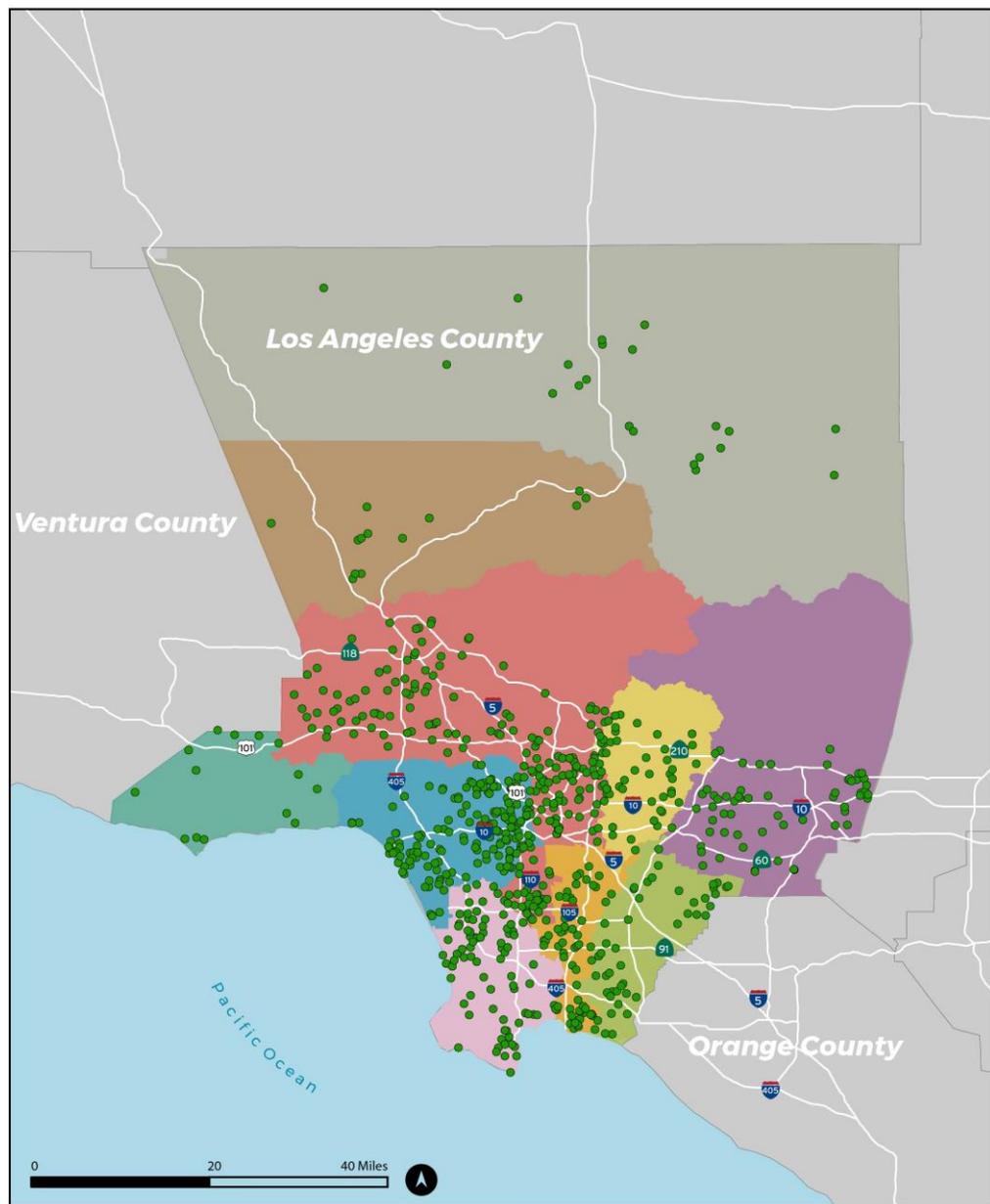
This study will investigate community gardens as a land use, identify site characteristics (i.e. land ownership, infiltration potential, etc.) to determine if the land use has the potential to contribute towards SCW Program goals.

- Primary Objective: Identify conditions under which Community Garden locations have potential for stormwater capture.
- Secondary Objectives: Engage through direct dialog with gardeners to understand their potential needs. Identify 3 locations that can serve as templates for planning purposes.
- Project Status: Planning
- Total Funding Requested: \$2,647,990 total/ \$378,285 per watershed.





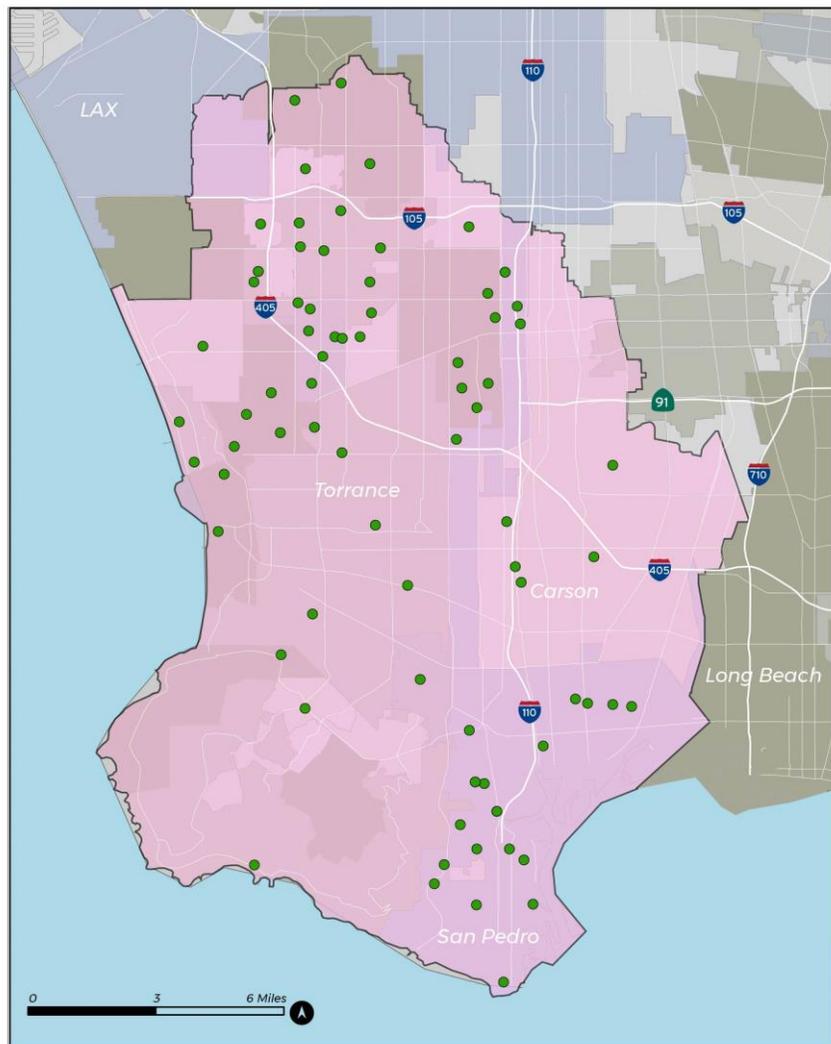
# Project Location



- Almost 800 Community Gardens across LA County
- Many are managed by community groups
- Community gardens serve diverse communities in the County



# Project Location



**Legend**  
Community Gardens ●  
South Santa Monica Bay (78)

## South Santa Monica Bay Watershed

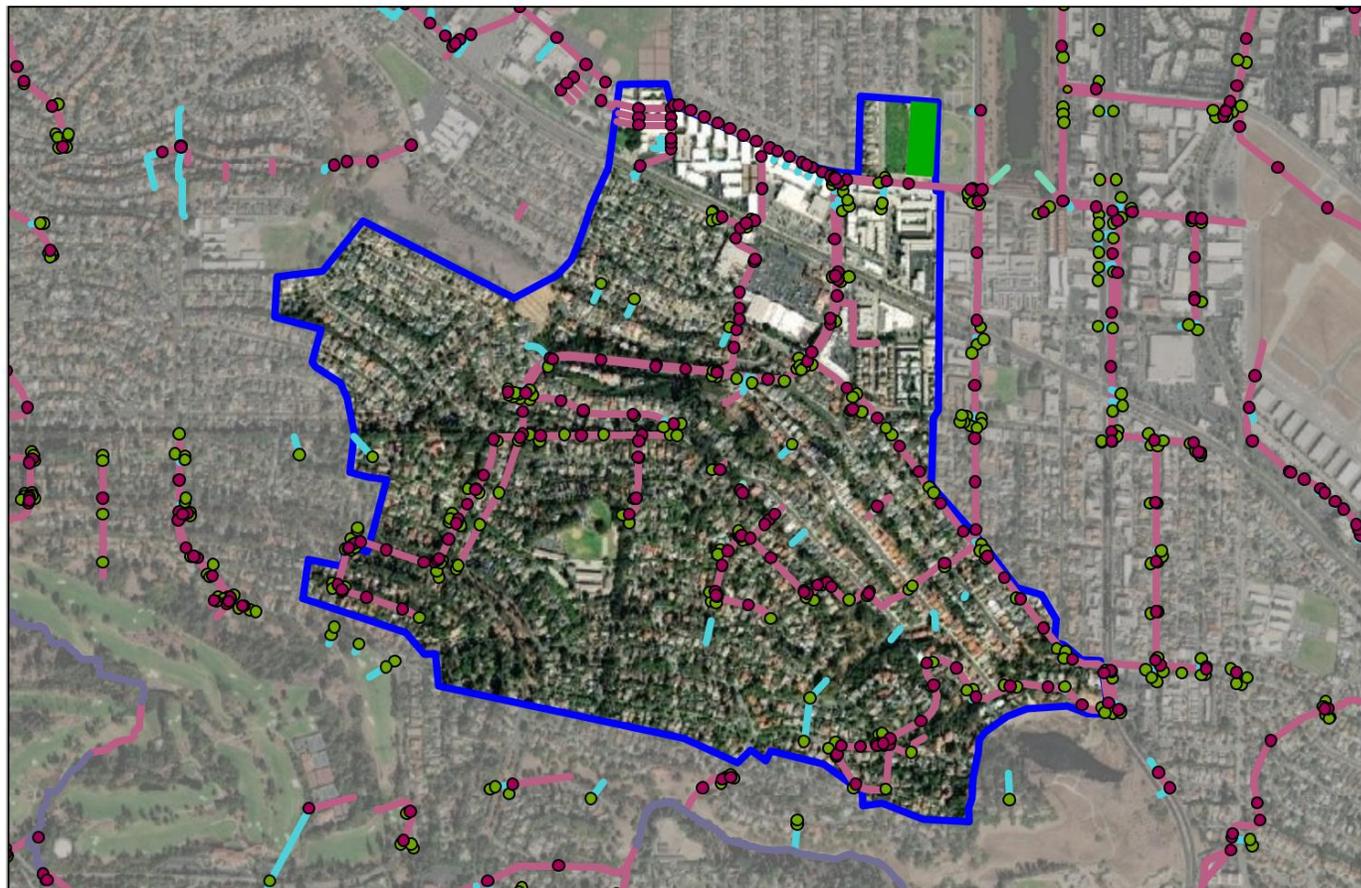
- 78 community gardens in the watershed



- Torrance Community Garden
  - Approximately 2.6 acres
  - Can gardens downstream of urban areas be redesigned to collect offsite “run-on” from these areas to provide pollutant reduction benefits to municipalities?



# Project Location



## Legend

-  Torrance Community Garden (2.61 acres)
-  Watershed Area (468 acres)

## Utilities

-  Maintenance Hole
-  Catch Basin
-  Gravity Main
-  Lateral Line
-  Open Channel
-  Natural Drainage

- Example Community Garden with Upstream Tributary Area
- Drainage area is 468 acres to the community garden





# Project Background

- Primary Objective: Identify conditions under which Community Garden locations have potential for stormwater capture.
- The Community Garden Stormwater Capture Scientific Study will propose and implement a methodology to compile and evaluate community garden sites to see if compatible with SCWP goals.



# Cost & Schedule

Schedule Milestone Table

Milestone Name	Completion Date
Database of Existing Community Gardens	01/03/2022
Develop Screening Criteria	03/01/2022
Preliminary Investigation	05/02/2022
Site Reconnaissance and Outreach	08/01/2022
Concept Reports and Fact Sheet	10/14/2022
SCW Program Technical Resources Funding Application	11/30/2022



# Funding Request

## Funding Requested Per Year Per Watershed

Funding Request Year	Watershed Area	Amount for Year
Year 1	Central Santa Monica Bay	\$ 189,142.00
Year 1	Lower Los Angeles River	\$ 189,142.00
Year 1	Lower San Gabriel River	\$ 189,142.00
Year 1	Rio Hondo	\$ 189,142.00
Year 1	South Santa Monica Bay	\$ 189,142.00
Year 1	Upper Los Angeles River	\$ 189,144.00
Year 1	Upper San Gabriel River	\$ 189,142.00
Total Year 1		\$ 1,323,996.00
Year 2	Central Santa Monica Bay	\$ 189,142.00
Year 2	Lower Los Angeles River	\$ 189,142.00
Year 2	Lower San Gabriel River	\$ 189,142.00
Year 2	Rio Hondo	\$ 189,142.00
Year 2	South Santa Monica Bay	\$ 189,142.00
Year 2	Upper Los Angeles River	\$ 189,142.00
Year 2	Upper San Gabriel River	\$ 189,142.00
Total Year 2		\$ 1,323,994.00
Total Funding		\$ 2,647,990.00

# Project Benefits

Identify under which conditions community gardens can function as stormwater capture facilities.

- Identify conditions under which Community Garden locations have potential for stormwater capture within the Watershed which will benefit WASC member agencies.
- Engage through direct dialog with gardeners to understand their potential needs.
- Identify 3 locations that can serve as templates for planning purposes.





**Questions?**