Capturing Stormwater – Can't We Do Better?

Southern California Water Dialogue

March 22, 2023

Southern California Water Dialogue
Co-chairs

CONNER EVERTS

Executive Director

Southern California Watershed Alliance

DEE ZINKE

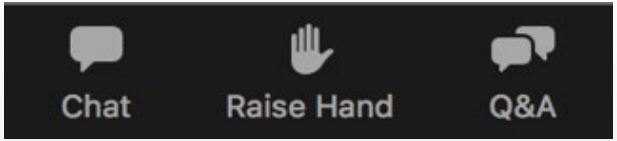
Assistant General Manager - External Affairs

The Metropolitan Water District of Southern California

Southern California Water Dialogue
Steering Committee

- ZITA YU
  Jacobs
- CHARLEY WILSON
  Southern California Water Coalition
- DIANE WALLACE
  Sierra Club
- PEER SWAN
  Irvine Ranch Water District
- MARTHA CAMACHO RODRIQUEZ
  Central Basin Municipal Water District
- ALYSON PIQUEE
  Inland Empire Utility Agency
- FERNANDO PALUDI
  Trabuco Canyon Water District
- FRED O'CALLAGHAN
  JPL/NASA (Retired)
- STEVEN JOHNSON
  Southern California Watershed Alliance
- TAMMY HIERLIHY
  West Basin Municipal Water District
- CHARMING EVELYN
  Sierra Club
- E.J. CALDWELL
  West Basin Municipal Water District
- RICH ATWATER
  Foothill Municipal Water District
- KATHY CALDWELL
  So Cal Water Dialogue, Coordinator

Webinar Ground Rules



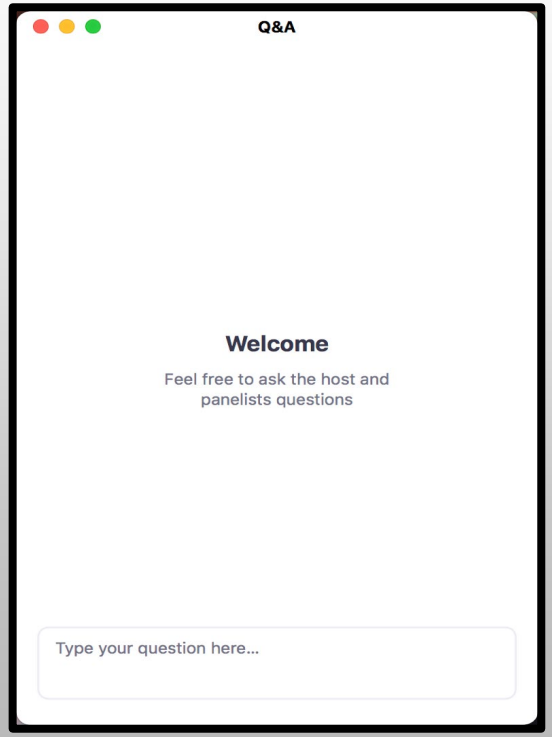
- **Technical Difficulties:** Use chat feature to let us know
- **Asking a Question:** Use Q/A feature, type in question, and click send. Questions addressed after presentation.
- **Poor Connection:** Move closer to your wireless router and turn off other services using bandwidth (e.g. Netflix)
- **Audio Muted:** Attendee audio on mute by default
- **Timetable** : Presentation runs apx 60 minutes followed by Q/A session

How to Ask A Question

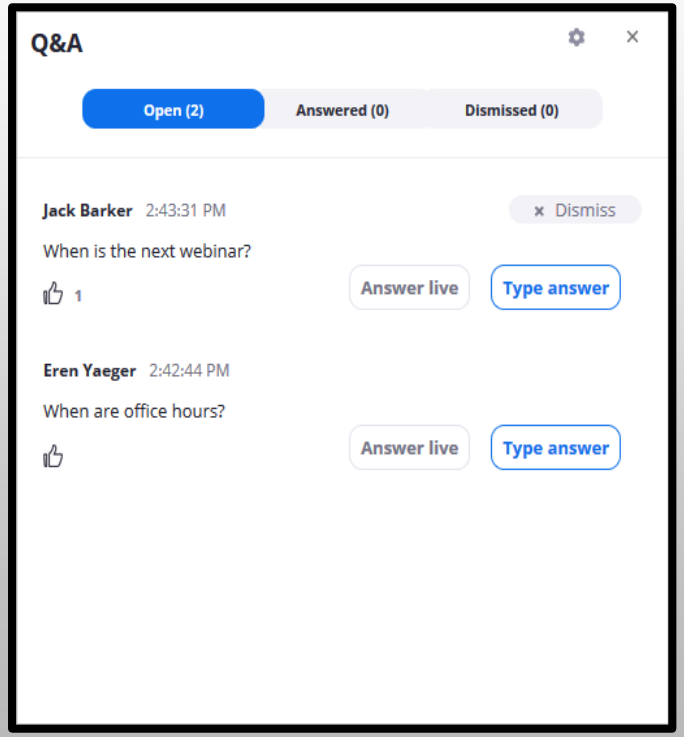
On the bottom of your screen, click “Q&A”

Southern California Water Dialogue

Type in question and then click send



You can upvote by clicking "thumbs up" icon



Southern California Water Dialogue

Agenda

- Announcements and Introduction of Speaker
- Topic overview – by Conner Everts
- Discussion
- Dialogue (Q/A) – Led by Dee Zinke
- Concluding remarks

Speakers

Greg Woodside
Executive Director
Planning and Natural Resources
Orange County Water District

Conor Mossavi
Civil Engineering Associate
Watershed Management Group
LADWP

Annelisa Ehret Moe
Water Quality Scientist
Heal the Bay

Optimizing Stormwater Capture in North/Central Orange County

Greg Woodside, P.G., C.Hg
Executive Director of Planning & Natural Resources

Southern California Water Dialogue
March 22, 2023

CALIFORNIA HAS UNIQUE ANNUAL VARIATIONS IN RAINFALL

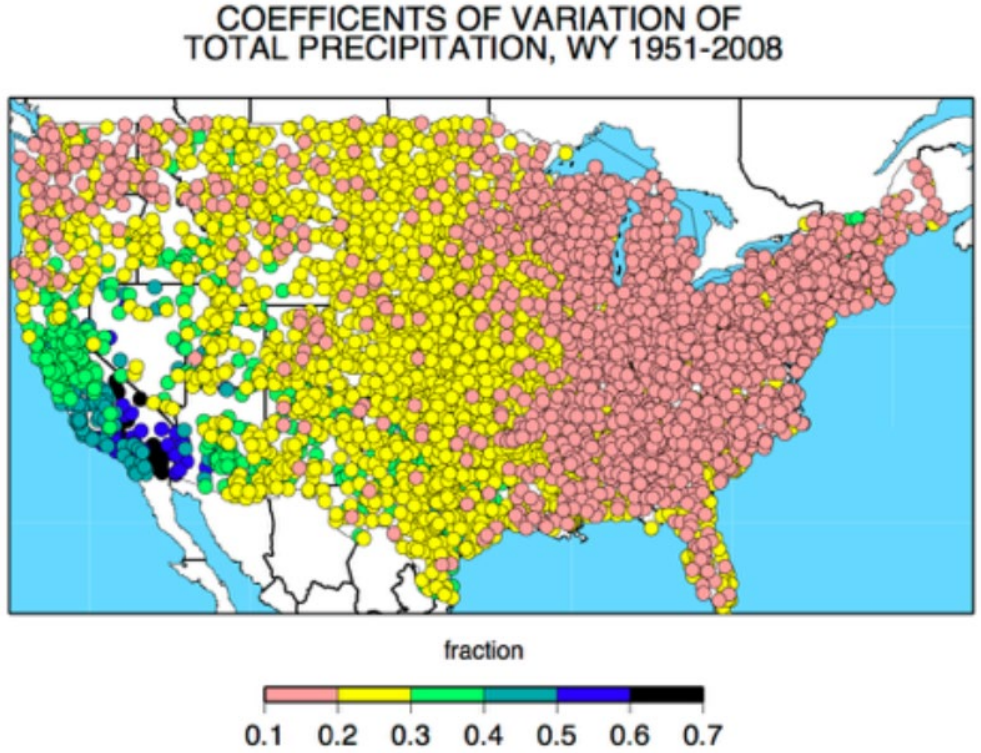
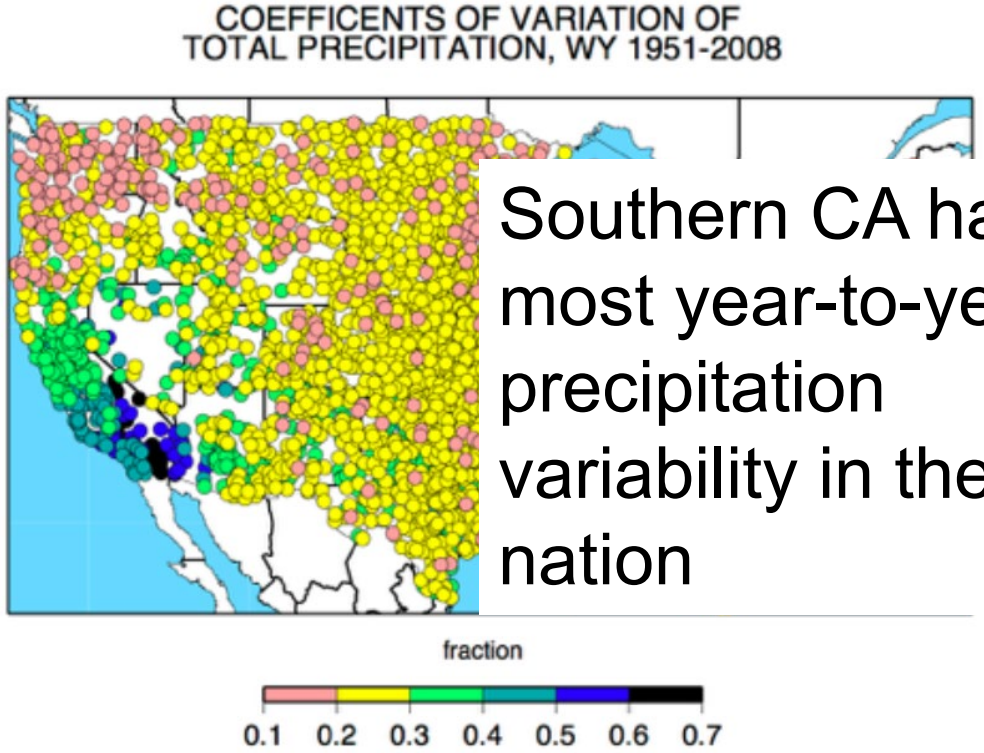


Figure 4. Coefficient of variation (the standard deviation divided by the average) of total precipitation based on water year data from 1951-2008.

Dettinger, et al, (2011)



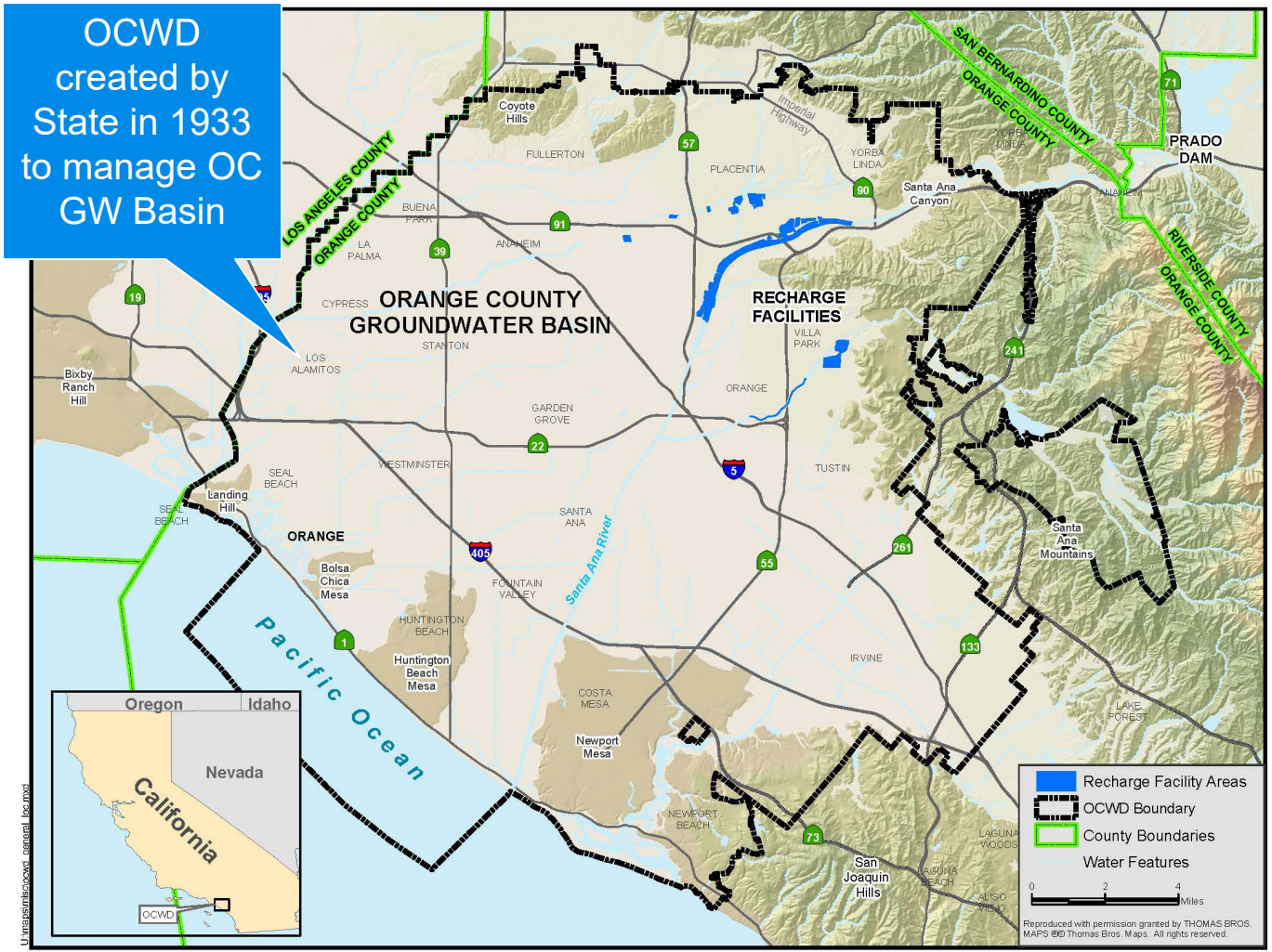
Southern CA has the most year-to-year precipitation variability in the nation

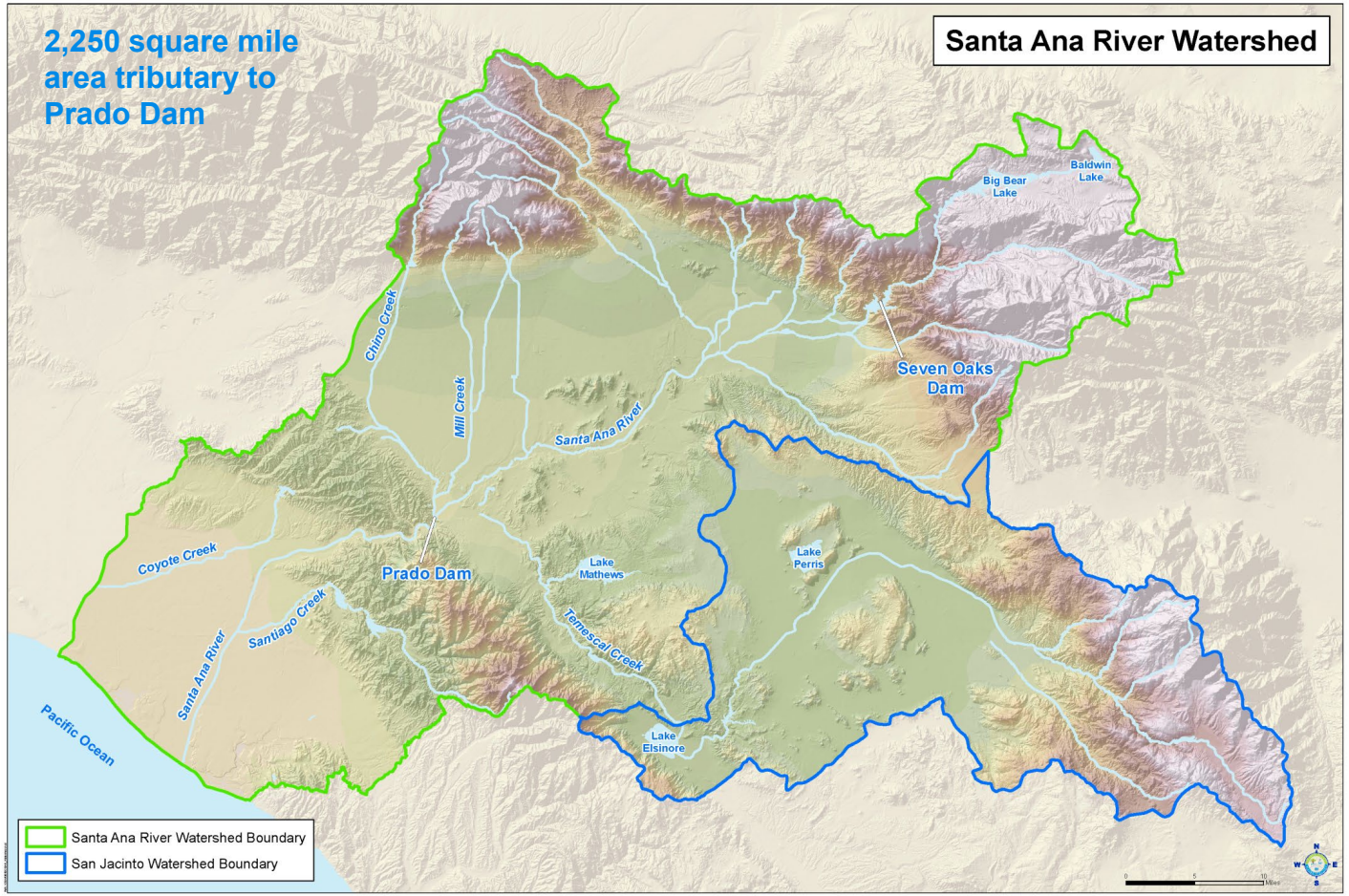
Figure 4. Coefficient of variation (the standard deviation divided by the average) of total precipitation based on water year data from 1951-2008.

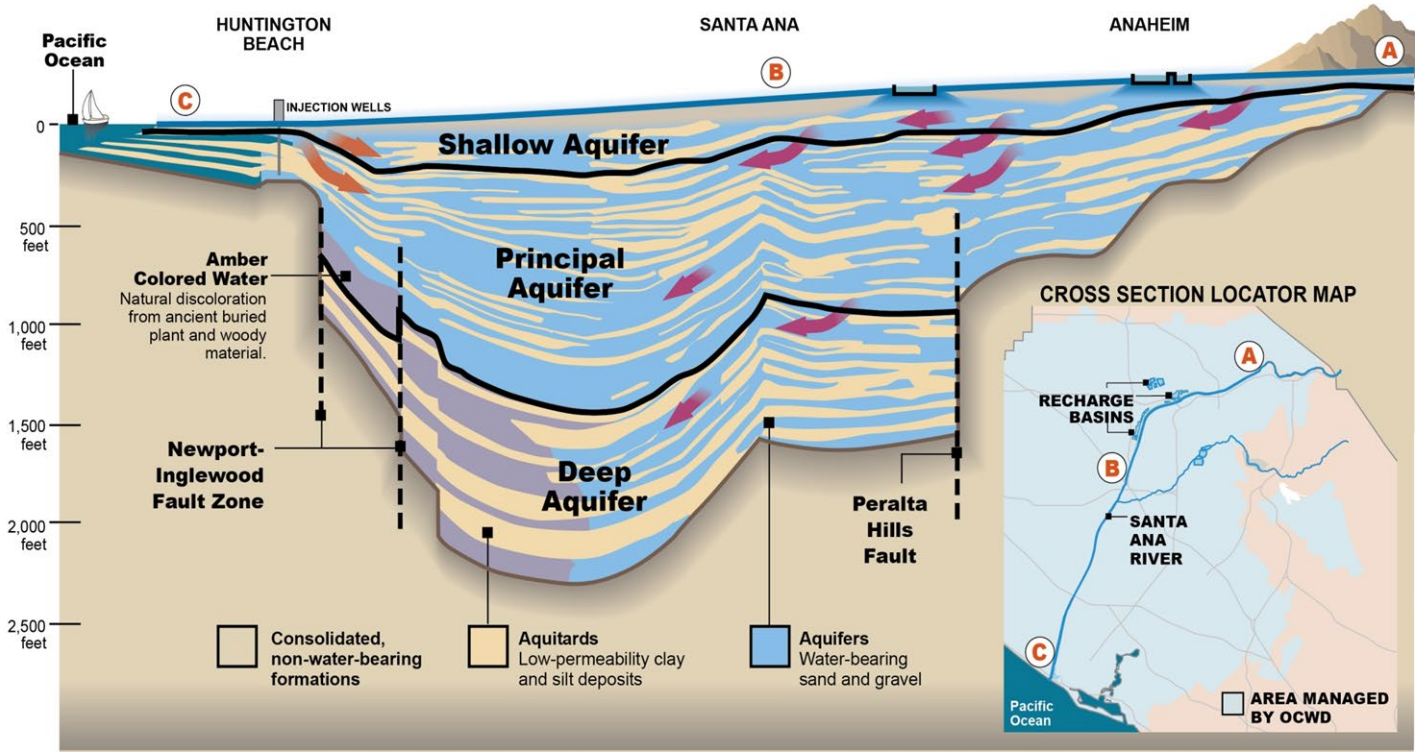
Dettinger, et al, (2011)

Example of year-to-year rainfall variability

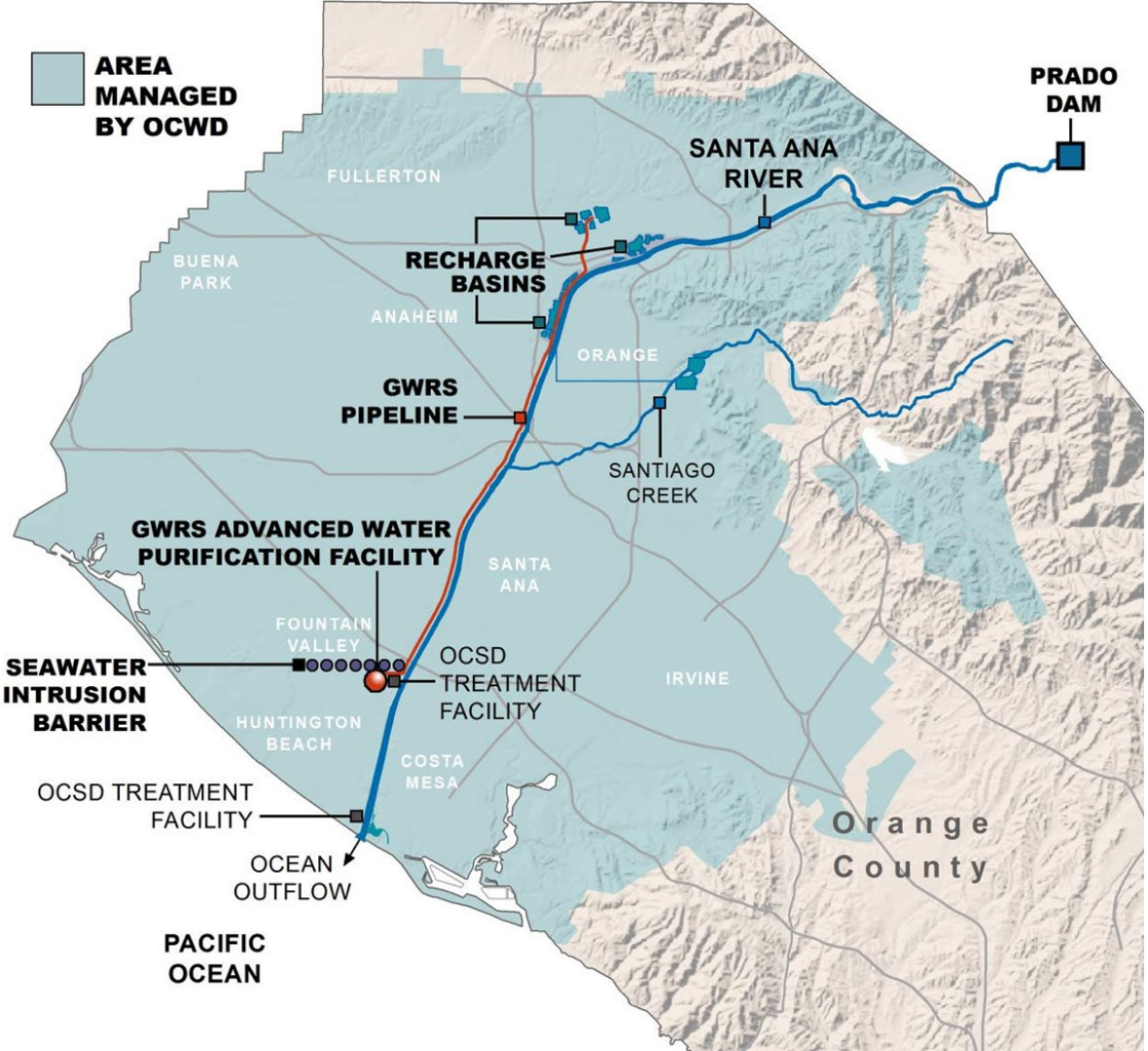
- Los Angeles
  - 143 years period of record
  - Maximum annual rainfall: 38 inches
  - Minimum annual rainfall: 4 inches
  - Average: 15 inches
- Atlanta, GA
  - period of record (1996-2021)
  - Maximum annual rainfall: 70 inches
  - Minimum annual rainfall: 32 inches
  - Average: 50 inches
  - Source: www.weather.gov/ffc/rainfall_scorecard


OCWD created by State in 1933 to manage OC GW Basin
ORANGE COUNTY GROUNDWATER BASIN
RECHARGE FACILITIES
LOS ANGELES COUNTY
ORANGE COUNTY
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
PRADO DAM
Coyote Hills
Imperial Highway
FULLERTON
PLACENTIA
YORBA LINDA
Santa Ana Canyon
BUENA PARK
LA PALMA
ANAHEIM
CYPRESS
STANTON
LOS ALAMITOS
Bixby Ranch Hill
VILLA PARK
ORANGE
GARDEN GROVE
WESTMINSTER
SEAL BEACH
Landing Hill
TUSTIN
SANTA ANA
Santa Ana River
Santa Ana Mountains
Bolsa Chica Mesa
FOUNTAIN VALLEY
HUNTINGTON BEACH
Huntington Beach Mesa
Pacific Ocean
IRVINE
COSTA MESA
Newport Mesa
LAKE FOREST
NEWPORT BEACH
LAGUNA WOODS
San Joaquin Hills
LAGUNA BEACH
ALISO VIEJO
Oregon
Idaho
Nevada
California
OCWD
Recharge Facility Areas
OCWD Boundary
County Boundaries
Water Features
0
2
4
Miles
Reproduced with permission granted by THOMAS BROS. MAPS ®© Thomas Bros. Maps. All rights reserved.
U:\mapping\ocwd_general_loc.mxd

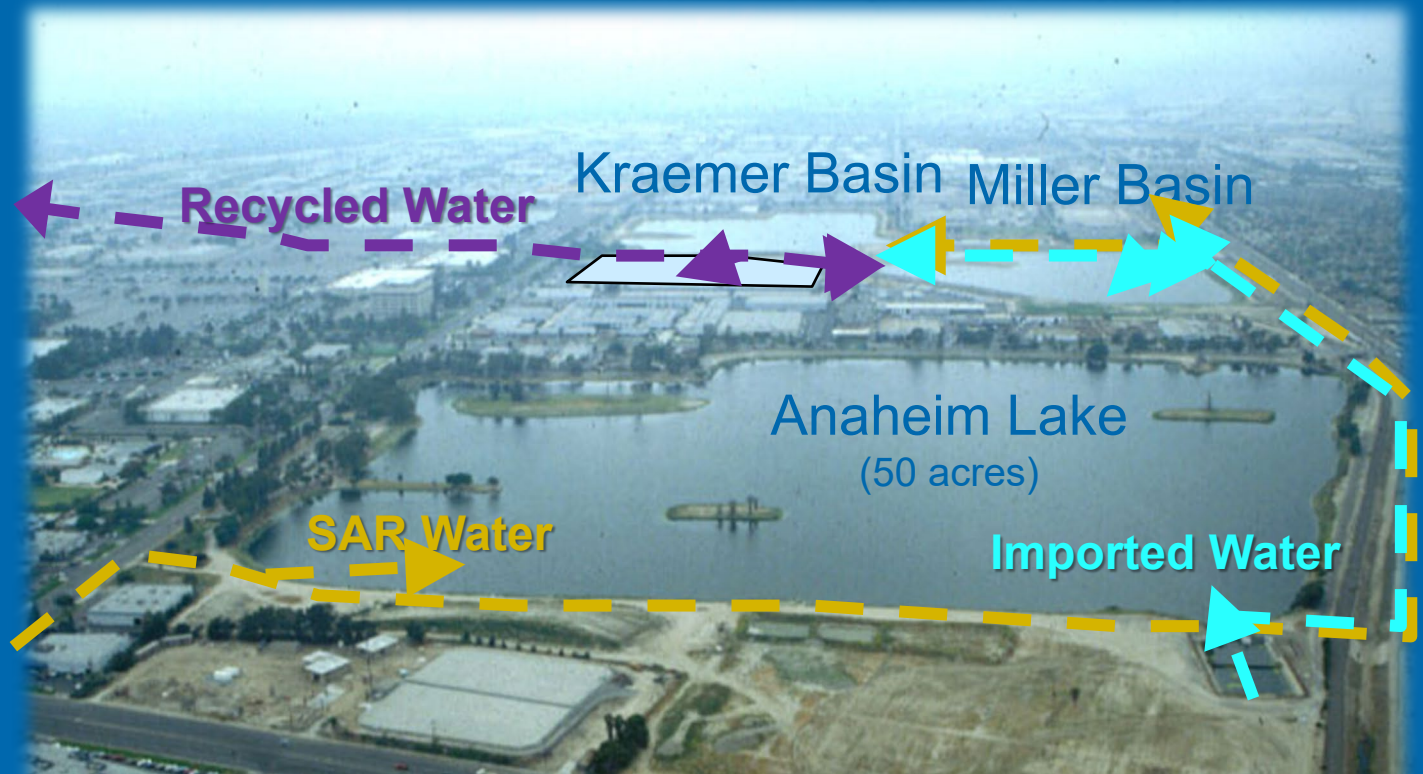

Santa Ana River Watershed
2,250 square mile area tributary to Prado Dam
Big Bear Lake
Baldwin Lake
Seven Oaks Dam
Chino Creek
Mill Creek
Santa Ana River
Coyote Creek
Prado Dam
Lake Mathews
Lake Perris
Santiago Creek
Temescal Creek
Santa Ana River
Pacific Ocean
Lake Elsinore
Santa Ana River Watershed Boundary
San Jacinto Watershed Boundary

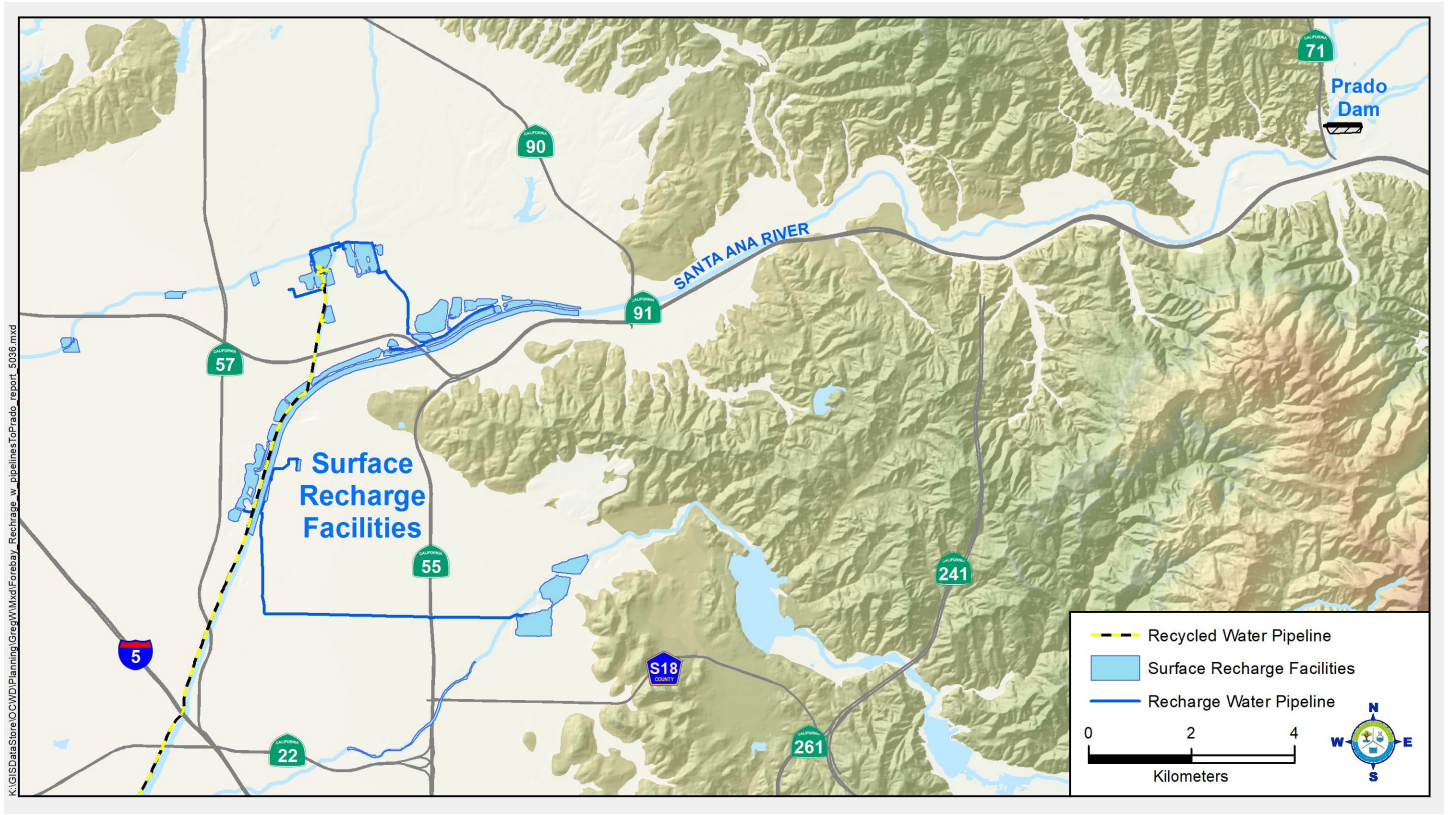


Pumping from groundwater basin provides ~85% of water supply


AREA MANAGED BY OCWD
PRADO DAM
SANTA ANA RIVER
FULLERTON
BUENA PARK
RECHARGE BASINS
ANAHEIM
ORANGE
GWRS PIPELINE
SANTIAGO CREEK
GWRS ADVANCED WATER PURIFICATION FACILITY
SANTA ANA
FOUNTAIN VALLEY
SEAWATER INTRUSION BARRIER
OCSD TREATMENT FACILITY
IRVINE
HUNTINGTON BEACH
COSTA MESA
OCSD TREATMENT FACILITY
OCEAN OUTFLOW
Orange County
PACIFIC OCEAN

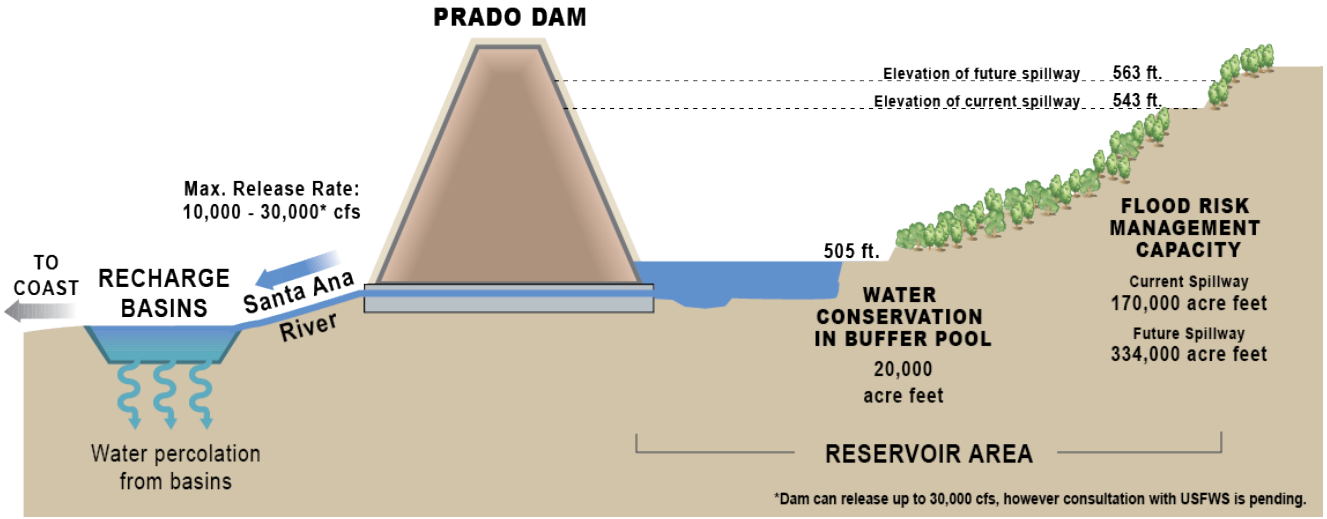
Flexibility to Recharge SAR, imported and recycled water in 3 facilities

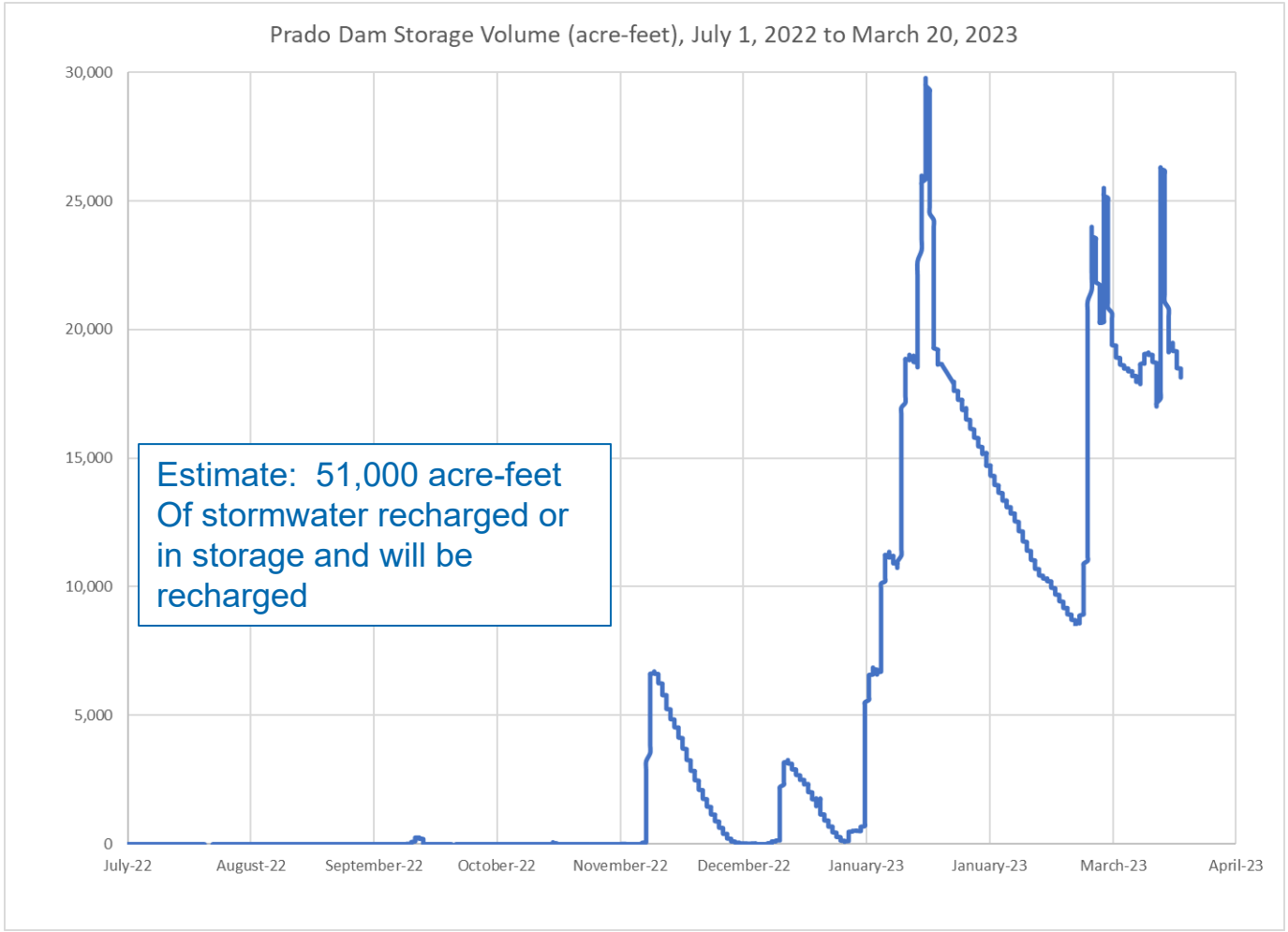



Prado Dam
SANTA ANA RIVER
Surface Recharge Facilities
71
90
91
57
55
241
5
S18
22
261
Recycled Water Pipeline
Surface Recharge Facilities
Recharge Water Pipeline
0
2
4
Kilometers
N
W
E
S
K:\GISDataStore\OCWD\Planning\Greg\Mxd\Forebay_Recharge_w_pipelinesToPrado_report_5036.mxd

Army Corps of Engineers & OCWD have long-standing Partnership in Prado Basin

Prado Dam


PRADO DAM
Elevation of future spillway 563 ft.
Elevation of current spillway 543 ft.
Max. Release Rate:
10,000 - 30,000* cfs
TO COAST
RECHARGE BASINS
Santa Ana River
505 ft.
WATER CONSERVATION IN BUFFER POOL
20,000
acre feet
FLOOD RISK MANAGEMENT CAPACITY
Current Spillway
170,000 acre feet
Future Spillway
334,000 acre feet
Water percolation from basins
RESERVOIR AREA
*Dam can release up to 30,000 cfs, however consultation with USFWS is pending.

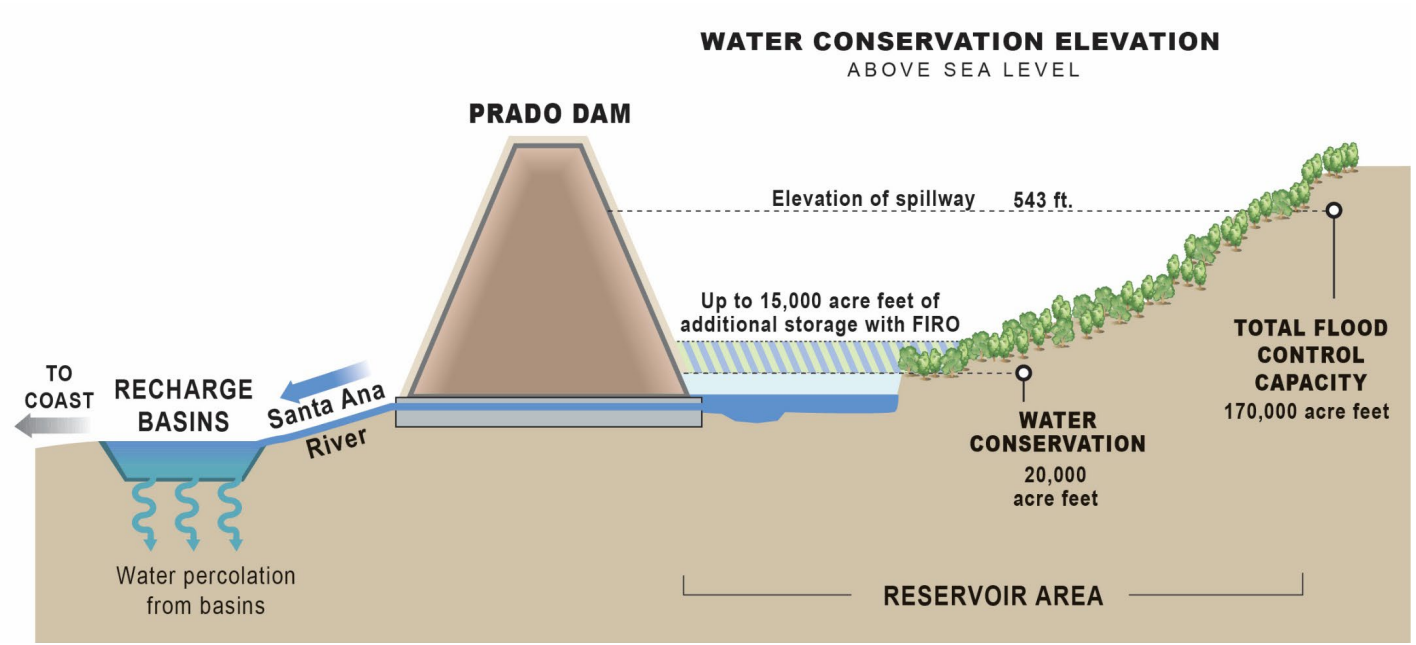

Prado Dam Storage Volume (acre-feet), July 1, 2022 to March 20, 2023
30,000
25,000
20,000
15,000
10,000
5,000
0
July-22
August-22
September-22
October-22
November-22
December-22
January-23
January-23
March-23
April-23
Estimate: 51,000 acre-feet
Of stormwater recharged or
in storage and will be
recharged

Can We Do Better?

Forecast Informed Reservoir Operations

- Using enhanced weather and runoff forecasting tools to inform reservoir operations
- Includes growing understanding of atmospheric river events
- Groundbreaking work completed for Lake Mendocino led by Sonoma Water, Army Corps and Dr. Martin Ralph/Scripps

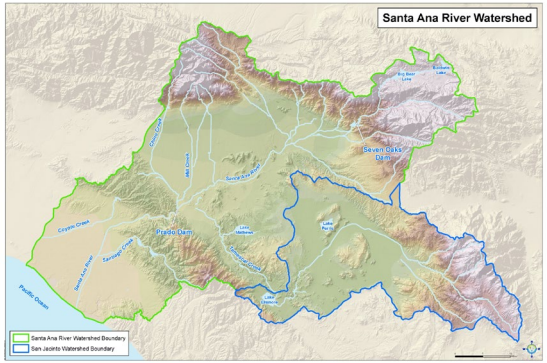
Forecast Informed Reservoir Operations (FIRO)



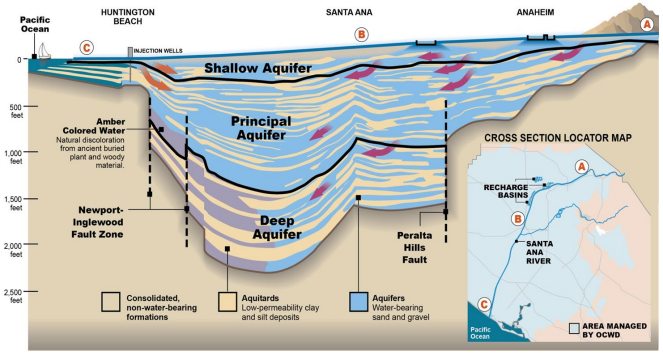
Army Corps processing a Deviation Request to test FIRO at Prado Dam

- Deviation requested based on results of Preliminary Viability Assessment of FIRO at Prado Dam
- 5-year period to test FIRO
- Additional 6,000 acre-feet storage
- Working to have deviation in place by October 2023

GEOGRAPHY



GEOLOGY



FACILITIES

COLLABORATION

- Army Corps of Engineers
- County of Orange Public Works
- State Water Resources Control Board
- US Fish & Wildlife Service
- CA Dept of Fish & Wildlife
- OCWD's 19 pumpers
- Many others

Water Resources Division

Stormwater Capture

Presented by Conor Mossavi

March 22, 2023

LADWP Stormwater Capture Presentation Overview

- Stormwater challenges and solutions
- Watershed management goals and strategies
- Stormwater project examples
- Regional coordination
- Multi-benefits and partnerships

LA's History with Stormwater

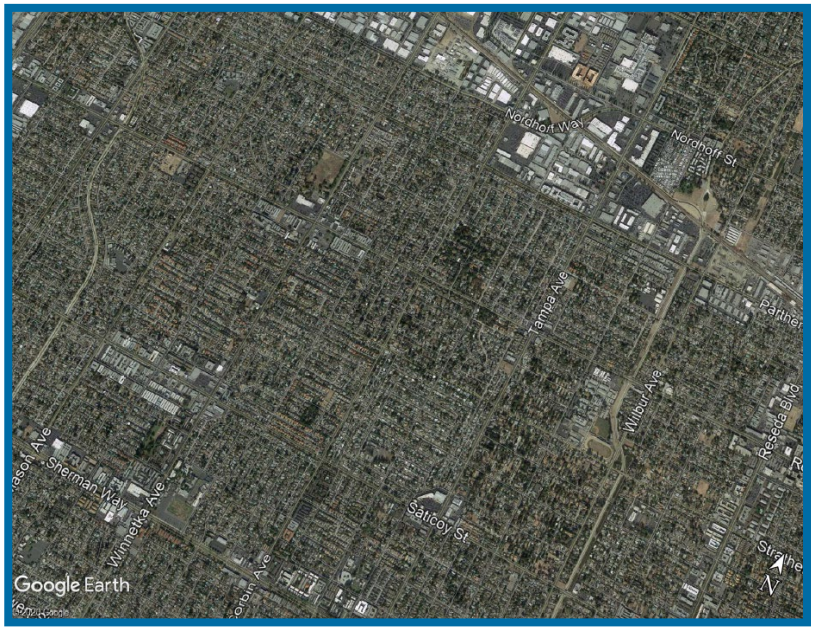
Challenges

- Stormwater channeled into ocean
- Carries harmful pollutants
- Urbanization reduces aquifer recharge
- Flooding issues

LA Flood of 1938

LA's History with Stormwater

1924



2018

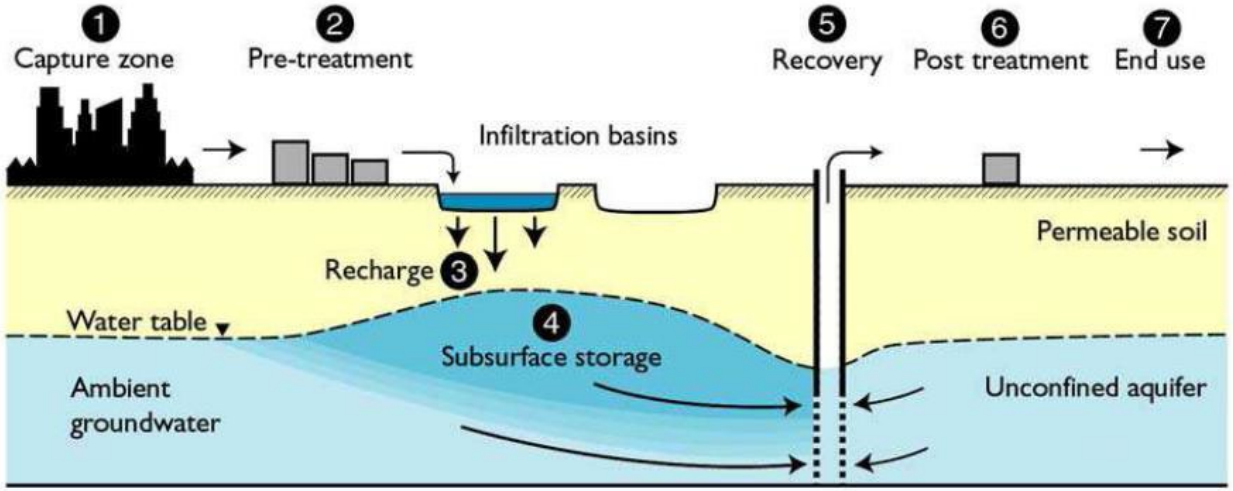
Urbanization in the San Fernando Valley

ladwp.com

LA's History with Stormwater

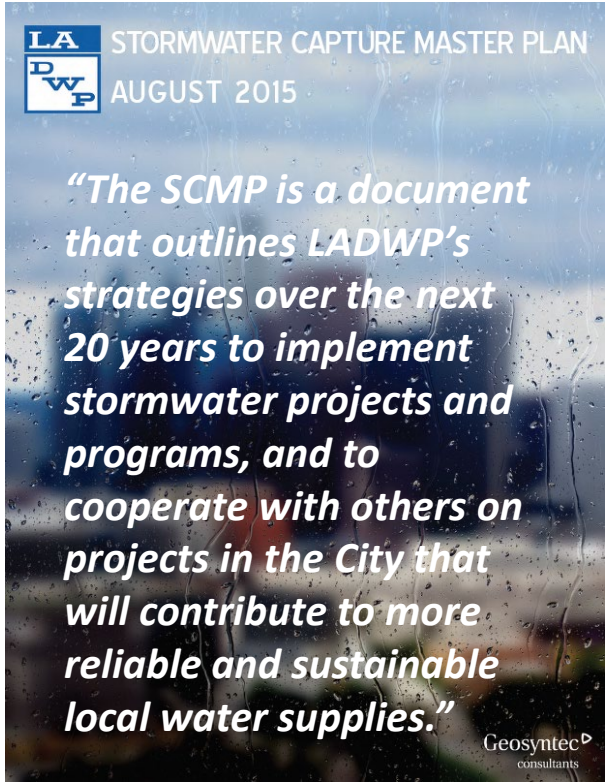
Solutions

- Watershed Management Group created in 2008
- Manages Water System's involvement in stormwater issues



Stormwater Capture Master Plan

- Approved by Board in August 2015
- Stormwater Capture Master Plan goals
  - Quantify stormwater capture potential
  - Identify projects, programs, & policies
  - Prioritize water supply criteria
  - Develop costs/benefits
  - Define timeline and milestones
  - Develop partnerships

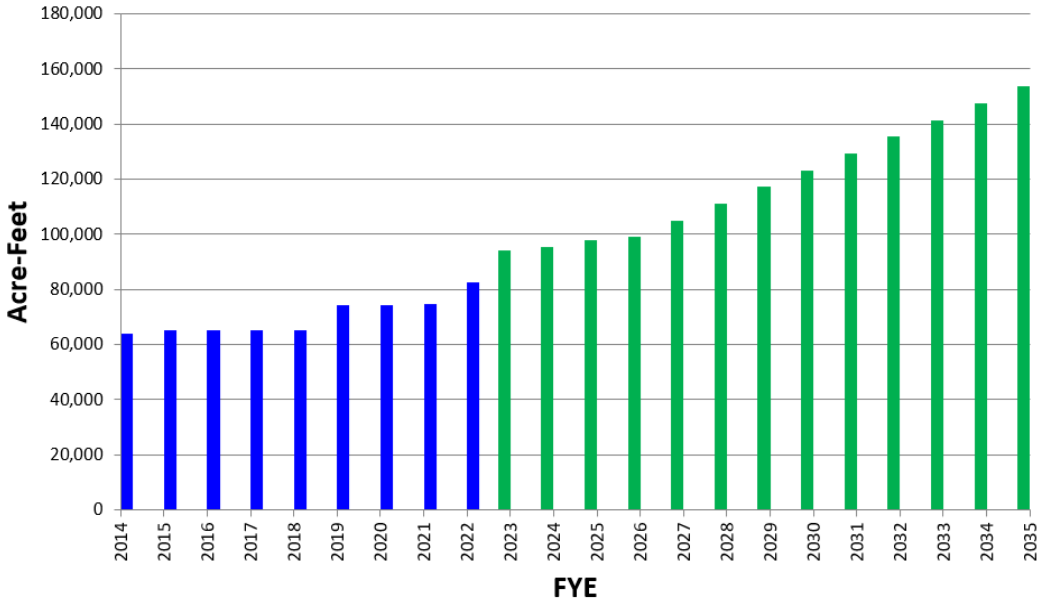


Watershed Management Goals

Local supply sustainability

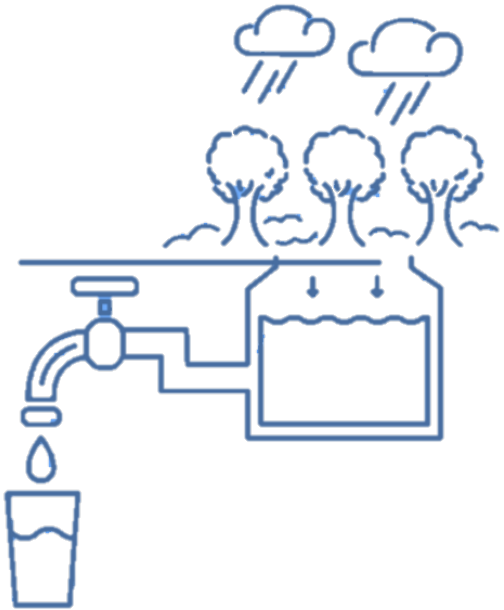
- Capture 150,000 AFY of stormwater by 2035
- Reduce reliance on imported water
- Improve drought resiliency
- Support the green economy

Stormwater Capture Capacity



Watershed Management Approach

- Recharge SFGB
- Reuse systems
- Diversion to water reclamation plant
- Leverage funding sources
- Forge new partnerships
- Multi-benefit approach

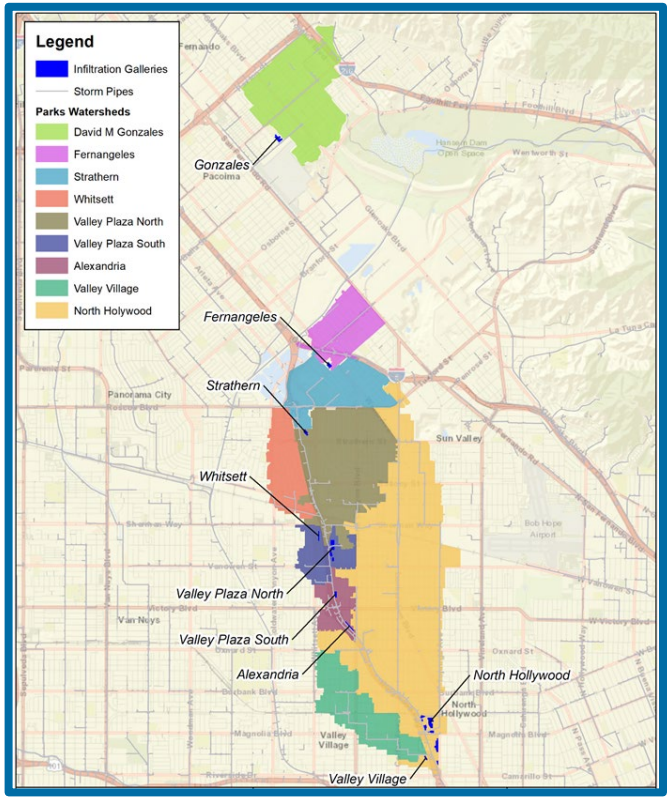


Tujunga Spreading Grounds Enhancement Project

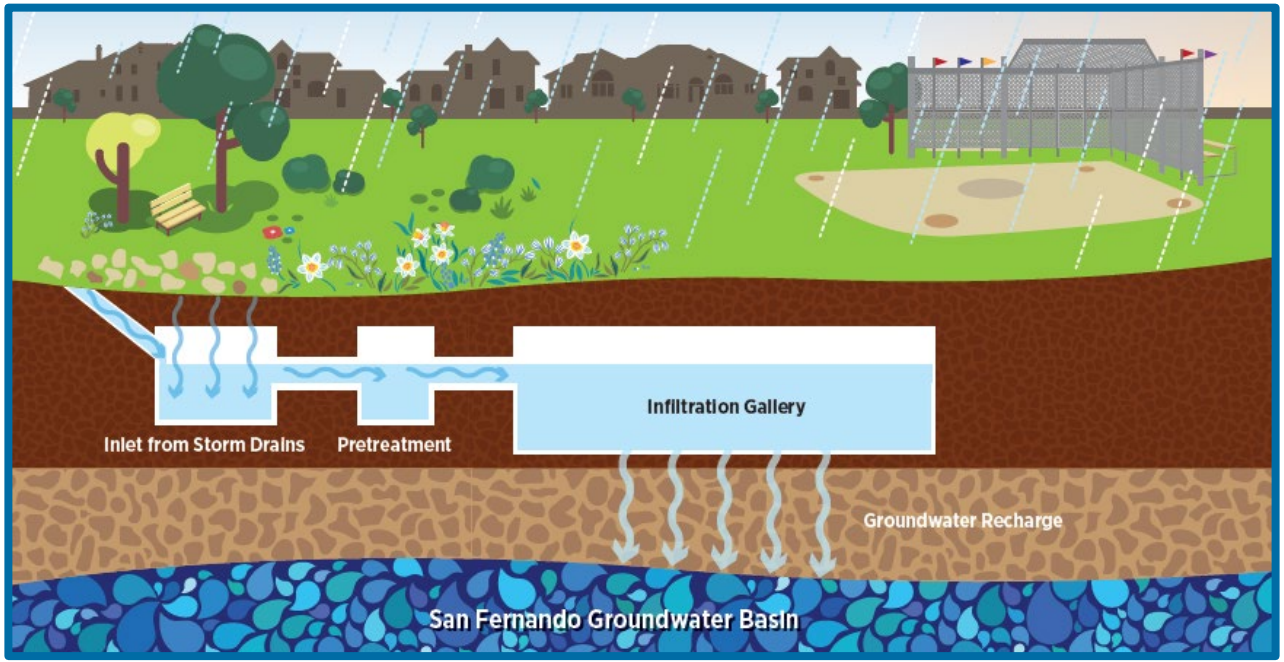
- Diverts from Tujunga Wash and Pacoima Wash to recharge SFGB
- Deepens and consolidates 20 spreading basins to 9 basins
- Added 8,000 AFY capacity for a total of 16,000 AFY
- Improves intakes and adds passive recreational components

Stormwater Capture Parks Program

- Stormwater capture projects at 9 parks
- Installs infiltration galleries overlying SFGB
- Captures and infiltrates nearly 3,000 AFY
- Incorporates community benefits
- Program Capital Cost ~ $504M
- Multi-agency partnership



Stormwater Capture Parks Program



Example Project Cross Section

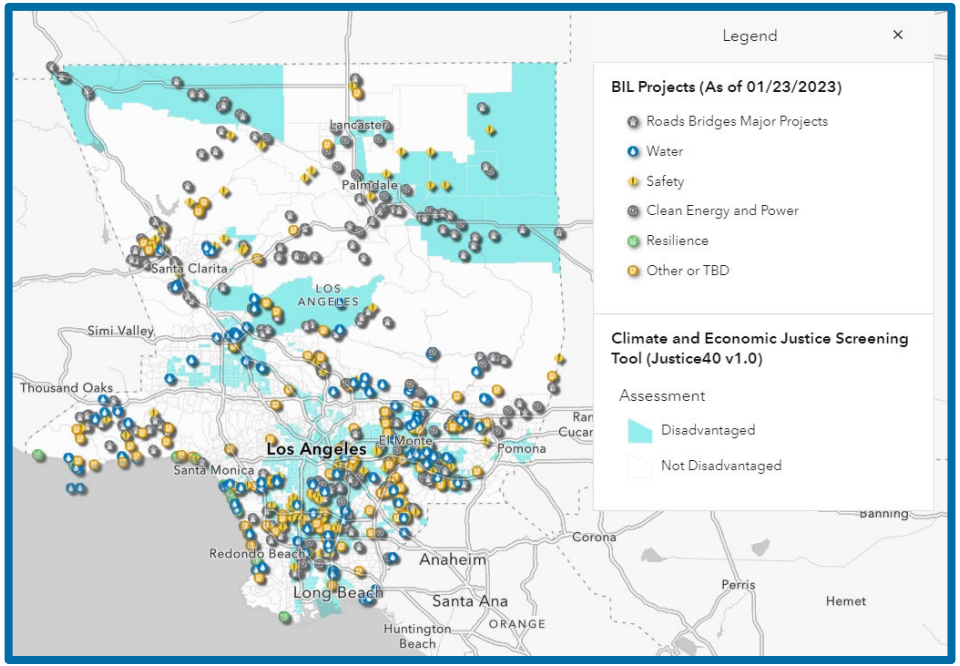
Projects – Distributed

- Capture < 100 AFY
- Green street projects
  - Bioswales, drywells, trees, new pavement
  - Transportation improvements
  - Enhances aesthetics
  - Mitigates flooding
  - Usually within public right-of-way
  - San Fernando Valley Distributed Projects

Woodman Avenue Green Street

Infrastructure LA Initiative

- November 2021: President Biden signed the Bipartisan Infrastructure Bill into law
- April 2022: LA County Board of Supervisors launched the Infrastructure LA Initiative
- Goal is to maximize region's share of federal funding
- Emphasis on projects that advance equity, sustainability, and climate resilience



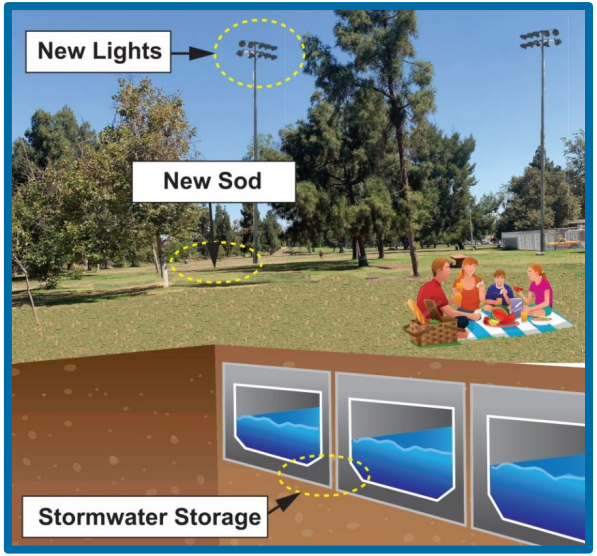
Infrastructure LA Initiative Project Map

Measure W – Safe, Clean Water Program

- Passed in November 2018
- Approved by 70% of LA County voters
- Parcel tax of 2.5 cents per sq. ft. of impermeable area
- Generates ~ $285M annually
- Managed by LA County Flood Control District

Measure W – Safe, Clean Water Program

- Funds projects, concepts, and studies that achieve the following multi-benefits:
  - Water supply
  - Water quality
  - Community benefits
  - Flood management
  - Nature-based solutions
- Funds could also be used for O&M



Multi-Benefits of Stormwater Capture

Partnerships

LACFCD: Spreading Grounds

Metro: Orange Line Infiltration Project

City of San Fernando: San Fernando Regional Park Infiltration Project

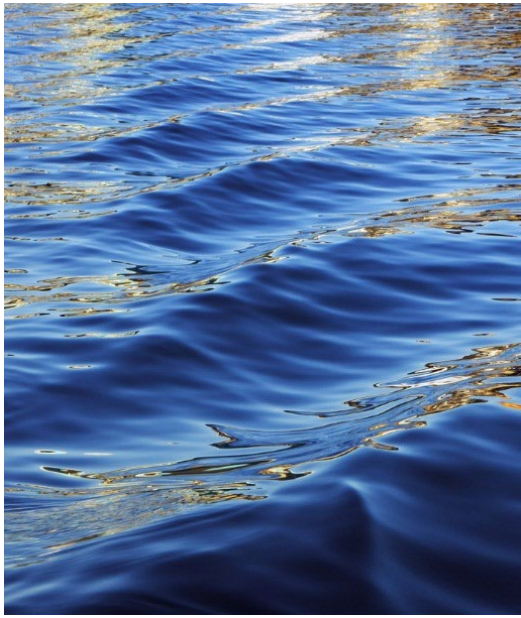
LASAN: Green Street Projects

LA DWP

ladwp.com

The Many Benefits of Stormwater

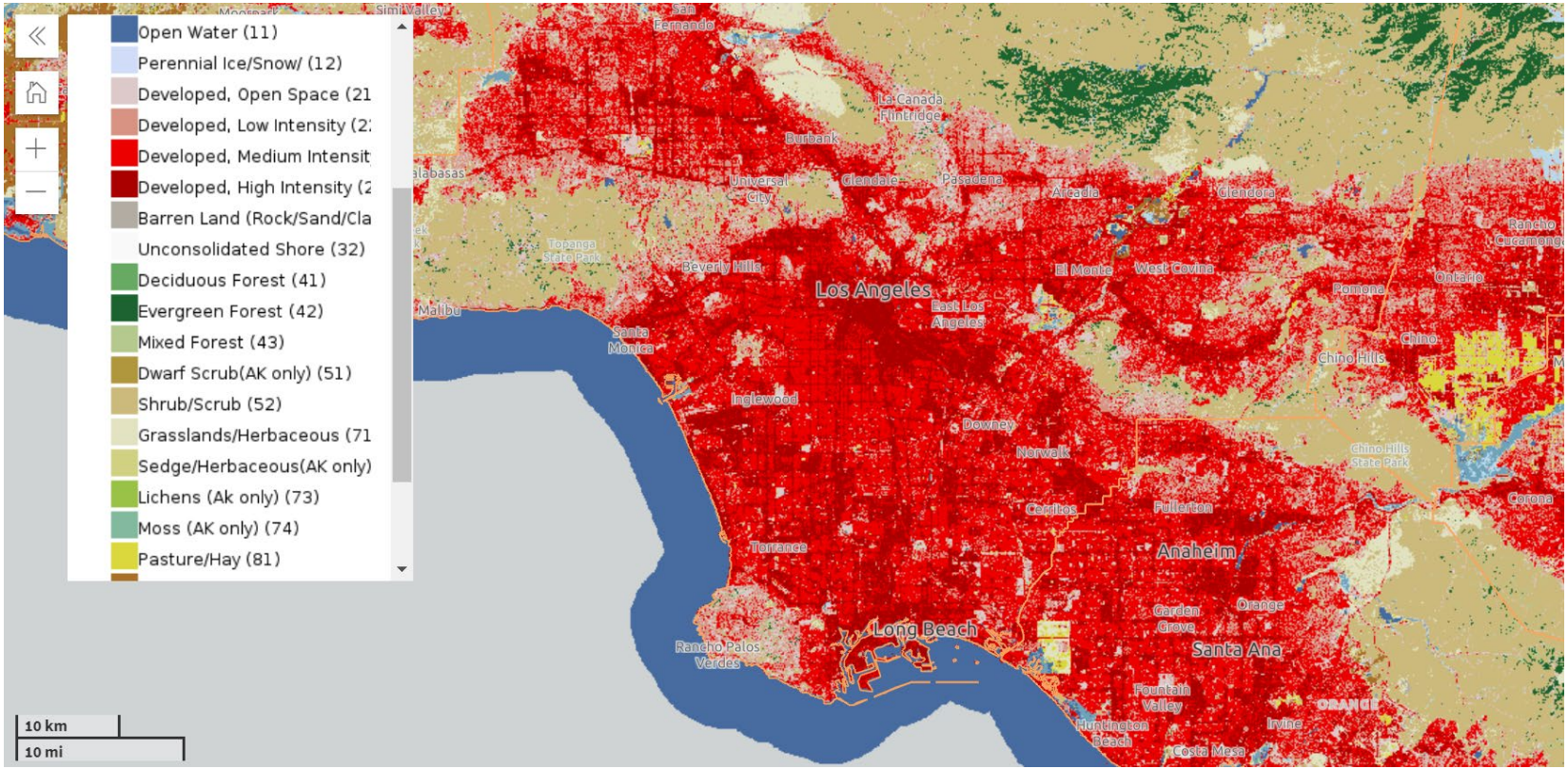
Annelisa Moe
Water Quality Scientist
Heal the Bay
03/22/2023



What is a Beneficial Use of water?

- A use of water resources that benefits people or nature
- Examples: water supply, recreation, commercial fishing, habitat, tribal culture, subsistence fishing

Stormwater and Urban Runoff



How's My Waterway - Community (epa.gov)

Stormwater and Urban Runoff

The Sacramento-San Joaquin Delta

- Important habitat to more than 750 animal and plant species
- Increasing unimpaired flow during winter-spring is necessary to fully support the Bay-Delta ecosystem

The Klamath River

- Minimum water levels upstream for suckerfish
- Minimum flows for salmon
- Water diversion for agricultural use

The LA River

- Flow necessary to sustain beneficial uses, and support species and habitat
- Primarily focused on minimum flow in dry-weather, but also evaluating stormwater capture scenarios

A rain garden. Image by Montgomery County Department of Environmental Protection.

Benefits of Stormwater Capture

- Water Quality
- Water Supply
- Reduced flooding
- Cooler temperatures
- More and better habitat
- Rebound of native plants and species
- Carbon sequestration
- Recreation
- Open space
- Education
- Jobs and training
- ETC!

Holistic Watershed Management

Woodman Avenue Median Retrofit

South LA Wetlands

From Lot to Spot: Larch Avenue Park

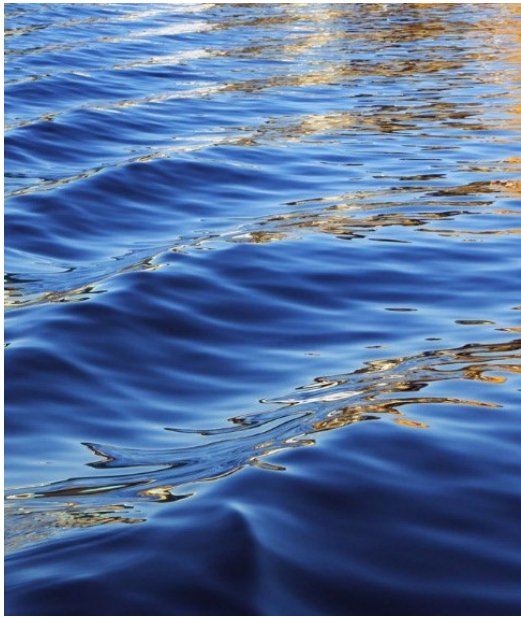
Elmer Ave Rain Garden

Photo by Timur Saglambilek

Dune restoration in Santa Monica
Photo Credit: The Bay Foundation

Any Questions?

Annelisa Moe – amoe@healthebay.org
https://healthebay.org/



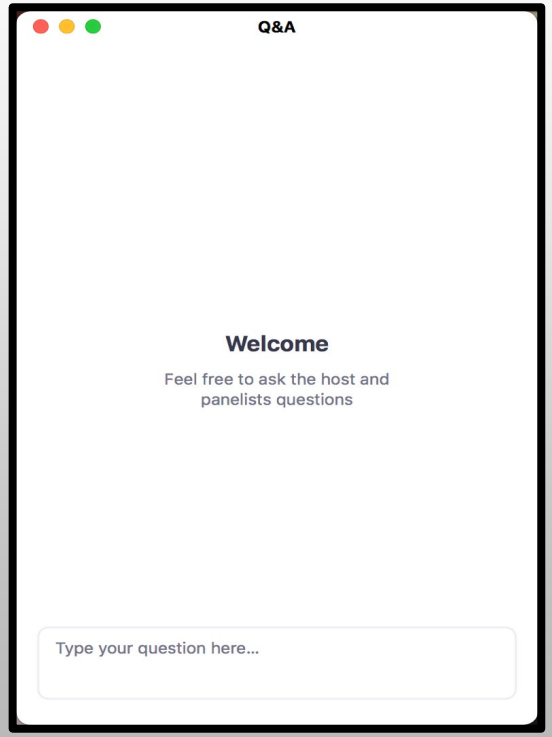
Question and Answer

How to Ask a Question

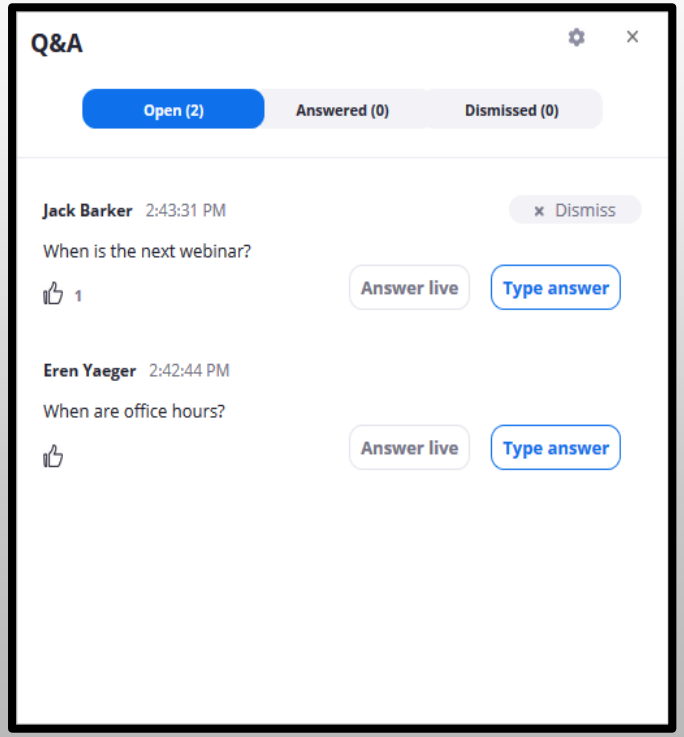
Click “Q&A” on the bottom of your screen

Southern California Water Dialogue

Type in question and then click send



You can upvote by clicking "thumbs up" icon



Southern California Water Dialogue

Next
Southern California Water Dialogue Webinar

Wednesday, April 26, 2023

Topic: Direct Potable Reuse

Your feedback on today's meeting is important to us.

For the next ten minutes, you can use the Zoom Chat feature to send us any comments.

Southern California Water Dialogue