…A United Voice for the Santa Ana River Watershed

OWOW Steering Committee Members

Jasmin A. Hall, Convener | SAWPA Commissioner
Bruce Whitaker, SAWPA Commissioner
Vacant, Orange County Supervisor
Vacant, Riverside County Supervisor
Curt Hagman, San Bernardino County Supervisor
Laura Roughton, Riverside County Municipal Representative
Jose Solorio, Councilmember, City of Santa Ana
James Hessler, Altman Plants
Garry W. Brown, Orange County Coastkeeper
Linda Ackerman, Regional Water Quality Control Board
Deborah Robertson, Mayor, City of Rialto

REGULAR MEETING OF THE

OWOW STEERING COMMITTEE

Thursday, January 24, 2019 – 11:00 a.m.

at SAWPA, 11615 Sterling Avenue, Riverside, CA 92503

AGENDA

1. **WELCOME AND INTRODUCTIONS**

2. **PUBLIC COMMENTS**
   Members of the public may address the Committee on items within the jurisdiction of the Committee; however, no action may be taken on an item not appearing on the agenda unless the action is otherwise authorized by Government Code §54954.2(b).

3. **APPROVAL OF MEETING MINUTES: September 27, 2018**
   November 15, 2018

4. **BUSINESS ITEMS**

   A. **Incorporating the Santa Ana River Parkway & Open Space Plan into the OWOW Plan Update 2018 (SC#2019.1)** — Mike Antos
   Recommendation: (1) Receive presentations by SAWPA staff and the California Coastal Conservancy about the Santa Ana River Parkway & Open Space Plan (2018); and, (2) Incorporate the Parkway & Open Space Plan by reference in an appendix to the OWOW Plan Update 2018.

B. **Incorporate the November 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan into the OWOW Plan Update 2018 (SC#2019.2)** — Mark Norton
Recommendation: (1) Receive a presentation from representatives of San Bernardino County about the November 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan; and, (2) Incorporate the 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan by reference in an appendix to the OWOW Plan Update 2018.

C. **OWOW Plan Update 2018 Sustainability Assessment (SC#2019.3)** — Mike Antos
Recommendation: Receive and file final report.

D. **Completion of the One Water One Watershed (OWOW) Plan Update 2018 (SC#2019.4)** — Mike Antos
Recommendation: Recommend the One Water One Watershed (OWOW) Plan Update 2018 be adopted by the SAWPA Commission.

E. **Disadvantaged Communities Involvement (DCI) Program – Update on Technical Assistance for Community Needs (SC#2019.6)** — Mike Antos
Recommendation: Receive and file.

F. **Orange County Stakeholders Letter (SC#2019.5)** — Mike Antos
Recommendation: Receive and file this informational report from SAWPA staff and provide guidance as appropriate.

5. ADJOURNMENT

PLEASE NOTE:
Americans with Disabilities Act: Meeting rooms are wheelchair accessible. If you require any special disability related accommodations to participate in this meeting, please contact (951) 354-4220 or kberry@sawpa.org. Notification at least 48 hours prior to the meeting will enable staff to make reasonable arrangements to ensure accessibility for this meeting. Requests should specify the nature of the disability and the type of accommodation requested.

Materials related to an item on this agenda submitted to the Commission after distribution of the agenda packet are available for public inspection during normal business hours at the SAWPA office, 11615 Sterling Avenue, Riverside, and available at www.sawpa.org, subject to staff's ability to post documents prior to the meeting.

Declaration of Posting

I, Kelly Berry, Clerk of the Board of the Santa Ana Watershed Project Authority declare that on Thursday, January 17, 2019, a copy of this agenda has been uploaded to the SAWPA website at www.sawpa.org and posted at the SAWPA office, 11615 Sterling Avenue, Riverside, California.

/s/

Kelly Berry, CMC

…A United Voice for the Santa Ana River Watershed

2019 – OWOW Steering Committee Meetings Fourth Thursday of Every Other Month (January, March, May, July, September, November) (NOTE: All meetings begin at **11:00 a.m.**, unless otherwise noted, and are held at SAWPA.)	
January 24, 2019	March 28, 2019
May 23, 2019	July 25, 2019
September 26, 2019	November 21, 2019*
* Meeting date adjusted due to conflicting holiday.	

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…A United Voice for the Santa Ana River Watershed

OWOW STEERING COMMITTEE

REGULAR MEETING MINUTES
SEPTEMBER 27, 2018

Committee Members	
Santa Ana Watershed Project Authority Representatives	
Ronald W. Sullivan, Eastern Municipal Water District	Present
Jasmin A. Hall, Inland Empire Utilities Agency	Present
County Supervisor Representatives	
Marion Ashley, Riverside County Board of Supervisors	Absent
Shawn Nelson, Orange County Board of Supervisors	Present
Curt Hagman, San Bernardino County Board of Supervisors	Present
County City Representatives	
San Bernardino County City Representative [Vacant]	Vacant
Laura Roughton, Councilmember, City of Jurupa Valley	Present
Jose Solorio, Councilmember, City of Santa Ana	Present [11:07 a.m.]
Business Committee Representative	
James Hessler, Director of West Coast Operations, Altman Plants	Present
Environmental Committee Representative	
Garry W. Brown, Convener, President, Orange County Coastkeeper	Present
Regional Water Quality Control Board Representative	
Linda Ackerman, Vice Chair, Santa Ana Regional Water Quality Control Board	Present

Others Present	
SAWPA COMMISSIONERS:	None.
SAWPA STAFF:	Rich Haller, Larry McKenney, Karen Williams, Dean Unger, Mike Antos, Kelly Berry
OTHERS PRESENT:	Heather Cooley, Director of Research with the Pacific Institute; Amanda Carr, Deputy Director, OC Environmental Resources; Michael Markus, General Manager, Orange County Water District

The OWOW Steering Committee meeting was called to order at 11:04 a.m. by Ronald W. Sullivan, Convener, at the Santa Ana Watershed Project Authority, 11615 Sterling Avenue, Riverside, California.

1. WELCOME AND INTRODUCTIONS

Roll call was duly noted and recorded. Mike Antos introduced Vic Nguyen, Chief, Southern Region Office, California Department of Water Resources Division of Integrated Regional Water Management.

Mr. Nguyen has reached out to engage with stakeholders and SAWPA staff and observe the work accomplished within the watershed.

2. PUBLIC COMMENTS

There were no public comments.

3. APPROVAL OF MEETING MINUTES – July 26, 2018

MOVED, approve the July 26, 2018 meeting minutes.

Result:	**Adopted (Passed)**
Motion/Second:	Hall/Brown
Ayes:	Ackerman, Brown, Hagman, Hall, Hessler, Nelson
Nays:	None
Abstentions:	Roughton, Sullivan
Absent:	Ashley, Solorio

4. INFORMATIONAL ITEMS

A. Pacific Institute Update on Activities in the Santa Ana River Waterside (SC#2018.19)

Heather Cooley, Director of Research with the Pacific Institute, provided a PowerPoint presentation titled, *Corporate Water Stewardship in the Santa Ana River Watershed*. Current work in the Santa Ana River Basin includes commercial and industrial properties, sustainable landscapes to improve water security and climate resilience in California, and context-based corporate water targets to reduce water risk and improve water security.

Committee Member Solorio arrived at 11:07 a.m., during the presentation of Agenda Item No. 4.A.

This item was for informational purposes; no action was taken on Agenda Item No. 4.A.

B. OWOW Program Update (SC#2018.20)

Mark Norton provided a PowerPoint presentation with a status report on the OWOW Program (inclusive of the OWOW Plan Update 2018, Disadvantaged Communities Involvement Program, Proposition 1 IRWM Implementation Grants), a copy of which was provided to Committee members, staff and the public. Public review of the draft OWOW Plan Update 2018 is anticipated in mid-October. The draft Project Solicitation Package (PSP) for the Proposition 1 IRWM Implementation Grants is anticipated to be released at any time; DWR funding area workshops will be conducted during the winter 2018/2019 timeframe. Round 1 grant applications are due to DWR early April 2019, with grant awards anticipated late 2019.

This item was for informational purposes; no action was taken on Agenda Item No. 4.B.

5. BUSINESS ITEMS

A. The OC Plan and the July 13, 2018 letter from the North/Central OC Watershed Management Area Agencies (SC#2018.18)

Mike Antos provided a PowerPoint presentation, a copy of which was provided to Committee members, staff and the public. Additional handouts included (1) July 13, 2018 letter from the North/Central OC Watershed Management Area Agencies, (2) two support letters (OC Stakeholders and Newport Bay Watershed Executive Committee), and (3) a rebuttal letter from OCWD to SC#2018.18; copies of which are made a part of the record by this reference.

Amanda Carr, Deputy Director, OC Environmental Resources provided a PowerPoint presentation titled, *The OC Plan and Integrated Regional Water Management in Orange County*. Within Orange County collaboration efforts, North and Central cities and water districts expressed concerns they did not feel that Orange County water resources needs were being effectively reflected in the OWOW Plan and the OWOW IRWM process, which was the impetus for the water district, sanitation district and Orange County to begin the update and further development of the OC Plan. The OC Plan combines the north and central areas into one area; all Santa Ana Region municipalities and water districts are included. This effort to update the OC Plan was to clarify specific water resource needs of Orange County; then through that clarification of needs, to hope for better integration within the OWOW Plan.

For illustrative purposes, Carr outlined management and operation in the San Diego funding area (SD Area), where Orange County takes on the role as the lead agency. This group, consisting of a 21-member executive committee supported by a management committee of high-level staff from agencies participating in IRWM, has been awarded $37 million in grant funding which has leveraged a total of $216 million in investment for south Orange County water resources. The SD Area has three separate regional water management groups – South Orange County, Upper Santa Margarita, and San Diego. The Tri-County FACC serves as the formal agreement under which the funding split is modeled on the population and land area calculation that the State utilizes to distribute the funds to all twelve funding areas. Under the Tri-County FACC, Orange County receives 13% because they are a small geographic/population area relative to San Diego, but they follow the model that the State has followed in distributing funds because they believe it is representative of the needs demonstrated by those areas. Collaboration is pursued within watershed and program areas.

Carr stated that relative to North and Central Orange County, less than 20% of the geographic area is still hydrologically connected to the Santa Ana River watershed. Prado Dam physically separates the upper and lower watershed. Orange County's major focus is surface water quality; North and Central Orange County have unique priorities such as beach water quality, seawater intrusion control, marine protected areas, and the ecological health of Upper Newport Bay. Concerns have existed since the beginning on whether the focus of Orange County stakeholders, water quality (including surface water quality) and coastal issues (Upper Newport Bay), could be effectively reflected within the OWOW Plan. They recognize that the goal of the OWOW Plan is to improve the overall health of the watershed through the Santa Ana funding area and they do agree that there are several interrelated issues; however, it is much easier for projects in the upper watershed to show downstream benefits versus projects that are in the lower watershed showing upstream benefits. Carr noted that the OC Stakeholders approaching the County to re-engage in IRWM planning for Orange County illustrates the fact that the OC Stakeholders have not felt engaged/heard through the OWOW process. They were hoping to clarify and reinvigorate the voice of the OC Stakeholders and further spur dialogue through their request for integration by becoming a chapter in the OWOW Plan.

Development and adoption of the OC Plan were outlined, as well as the rating and ranking differences between the OC Plan and the OWOW Plan. The highest-score focus of the OC Plan, adequate/reliable water supplies and protect/enhance water quality, do not map to the OWOW plan. The OC Stakeholders place water reliability and supply and surface water quality as equal-weighted goals; this is not sufficiently reflected in the OWOW Plan to address the needs OC Stakeholders have identified as their top concerns. Water quality in Newport Bay, a focus of OC Stakeholders, is completely unrelated to water coming down the Santa Ana River and they feel that the OWOW Plan is solely focused on water coming down the Santa Ana River. So, when

projects in Newport Bay Watershed/Huntington Harbor Watershed are put forth in the OWOW Plan, they are less competitive because the OWOW Plan is focused mainly on water supply and on areas hydrologically connected.

Allocation of 38% of total available grant funds to projects in Orange County was requested in the July 13, 2018 letter from the North/Central OC Watershed Management Area Agencies. In addressing that request, Carr noted that 38% was based on the way the State allocated funding statewide to address both land area and population. Population plays a large role in bringing money to the funding area; they believe that population and land area should be used to divide money within this funding area. In addressing information contained in OWOW SC memorandum 2018.08 provided by staff for this discussion which stated the DWR is uncomfortable with the funding split that has been negotiated within the SD Area, Carr respectfully disagreed. As the manager for that area, Carr stated that has never been communicated to her during frequent conversations with the Director of Finance for the IRWM program.

Committee Members Hagman and Solorio noted they were in the State Legislature at the time, and the intent of this funding was to encourage people to work together within regional efforts, not individual counties or looking at geographical boundaries. They were seeking a holistic perspective giving the flexibility to regions relating to their own needs, not per population. Carr noted the OC Plan sets forth their needs and makes their request very clear to have meaningful integration in the OWOW process; alternatively, their IRWM plan is compliant and they can go to DWR and ask to be a separate regional water management group within the Santa Ana funding area. This is their request to have meaningful integration into the OWOW Plan and remain within the OWOW Plan.

Discussion continued regarding success within the SD Area, purpose and funding as well as rating and ranking of the OC Plan versus the OWOW Plan. Committee Member Solorio noted that within spans of time demographics change and other areas will grow; this conversation is very important and timely, and these are reasonable requests. Orange County is an important stakeholder to SAWPA overall; they have represented they feel shortchanged over several years, and this is the time to make it right.

Convener Sullivan noted the OWOW process has been an evolution over the past ten years; it has always been a competitive process for the benefit of the entire watershed, not individual areas, counties or districts. There has never been a guaranteed amount for a specified area. We are trying to support continuing a competitive grant program for the betterment of the entire watershed.

Mike Antos reported on recent communication efforts, noting a result of which is a proposal for a program goal to ensure projects within any one county will not receive less than 25% of the available funding. Carr noted this does not address the fact that OC goals of water quality and water supply are not reflected in the ranking and scoring process of the OWOW Plan. They accordingly request their projects come through their plan and scoring process, as a chapter under the OWOW Plan umbrella. Convener Sullivan suggested obtaining current population data, not 2010 data used in the OC calculations, and take that data forward to calculate what would be expected in 2020 and 2030; then come back with more accurate information so the Committee can decide with current data.

Committee Member Hall left the meeting at 12:23 p.m. and did not return.

Commissioner Bruce Whitaker noted that significant stretches of coastal areas are unique in Orange County relating to the Santa Ana Watershed. Committee Member Brown noted the

benefit and connectivity relating to groundwater throughout the watershed and support of the holistic approach to the watershed but voiced a problem with a guaranteed percentage because it moves against the purpose of the OWOW process; Brown supported integration of the OC Plan within the OWOW Plan. He would like to see a more robust effort taking into account the coastal region when it comes to project rating and ranking.

Mike Markus expressed the OC Stakeholders believe the OC Plan process is superior to that being proposed in the OWOW Plan, and encouraged the Committee take that into consideration and not just the guaranteed percentage of funding requested.

Committee Member Roughton noted she was not comfortable with the guaranteed percentage; she appreciated the robust discussion and encouraged it to continue. She was supportive of resiliency language but emphasized the need for more work among staff before she would be comfortable to vote on the item. Committee Member Hessler noted he was struggling with the guaranteed percentage, but he understands the concerns regarding competitiveness and alignment of goals expressed by Orange County and does not think the language fully addresses those concerns. Committee Member Ackerman was not prepared to vote on the item until she received more data and noted she would like to know how and to what degree climate change was discussed with the Pillars. Committee Member Solorio supported looking at current population numbers and noted it would be interesting to know how much money each of the counties have received over the past 10 years; Solorio noted water quality should be included and perhaps moved up in priority. Convener Sullivan reiterated there was no goal to shortchange the coastal region; it is a competitive program and will never be perfect. Committee Member Hagman encouraged we take into consideration what the language of the bond states and we should determine how close we are to following what is set forth in the water bond.

The information provided was received by the OWOW Steering Committee; however, direction was provided to SAWPA staff but no action was taken on Agenda Item No. 5.A.

6. ADJOURNMENT

The meeting came to a close at 1:08 p.m.

APPROVED: November 15, 2018

_____

Ronald W. Sullivan, Convener

Attest:

_____

Kelly Berry, CMC, Clerk of the Board

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…A United Voice for the Santa Ana River Watershed

OWOW STEERING COMMITTEE

REGULAR MEETING MINUTES
NOVEMBER 15, 2018

Committee Members	
Santa Ana Watershed Project Authority Representatives	
Ronald W. Sullivan, Convener, Eastern Municipal Water District	Present
Jasmin A. Hall, Inland Empire Utilities Agency	Present
County Supervisor Representatives	
Marion Ashley, Riverside County Board of Supervisors	Absent
Shawn Nelson, Orange County Board of Supervisors	Present
Curt Hagman, San Bernardino County Board of Supervisors	Present
County City Representatives	
San Bernardino County City Representative [Vacant]	Vacant
Laura Roughton, Councilmember, City of Jurupa Valley	Present
Jose Solorio, Councilmember, City of Santa Ana	Absent
Business Committee Representative	
James Hessler, Director of West Coast Operations, Altman Plants	Absent
Environmental Committee Representative	
Garry W. Brown, President, Orange County Coastkeeper	Absent
Regional Water Quality Control Board Representative	
Linda Ackerman, Vice Chair, Santa Ana Regional Water Quality Control Board	Present

Others Present	
SAWPA COMMISSIONERS:	Bruce Whitaker
SAWPA STAFF:	Rich Haller, Larry McKenney, Karen Williams, Jerry Oldenburg, Mike Antos, Kelly Berry
OTHERS PRESENT:	Nick Kanetis, Deputy General Manager, Eastern Municipal Water District; Amanda Carr, Deputy Director, OC Environmental Resources

The OWOW Steering Committee meeting was called to order at 11:05 a.m. by Ronald W. Sullivan, serving as Convener, at the Santa Ana Watershed Project Authority, 11615 Sterling Avenue, Riverside, California; however, a quorum was not present. Accordingly, the record will reflect that no actions were taken by the Committee. The Committee did receive informational reports as outlined below.

1. WELCOME AND INTRODUCTIONS

2. PUBLIC COMMENTS

There were no public comments.

3. APPROVAL OF MEETING MINUTES – September 27, 2018

Due to lack of quorum, Agenda Item No. 3 will be brought before the Committee for consideration at a future meeting.

4. INFORMATIONAL ITEMS

A. OWOW Plan Update (SC#2018.23)

Mike Antos provided a PowerPoint presentation with a status report on the OWOW Plan Update 2018, a copy of which was provided to Committee members, staff and the public. The OWOW Plan Update 2018 is assembled and formatted for release for a public comment period beginning November 19 to December 14, 2018. Comments received will be processed by SAWPA staff, and the final and complete OWOW Plan Update 2018 will be brought forward for review and approval to the OWOW Steering Committee in January 2019. Following the recommendation of the OWOW Steering Committee, the OWOW Plan Update 2018 will be brought before the SAWPA Commission for approval in February 2019.

This item was for informational purposes; no action was taken on Agenda Item No. 4.A.

B. OWOW Program Update (SC#2018.24)

Mike Antos provided a PowerPoint presentation with a status report on the OWOW Program, a copy of which was provided to Committee members, staff, and the public. The Draft Project Solicitation Package (PSP) has been submitted by DWR and the public comments are due December 14. SAWPA will release a Call for Projects for Proposition 1 grant funding on November 26, which links to the online tool for data submission system. Thereafter the list of projects will be rated and ranked based on the Proposition 1 and OWOW eligibility criteria and the weighting of priorities as agreed upon the OWOW Steering Committee. It is anticipated that the public release of the draft ranked project list will be available February 2019, and the final application package be submitted to DWR in June 2019.

Convener Sullivan thanked everyone and noted that it will be his last meeting as a convener for the OWOW Steering Committee and shared that he's seen a lot of progress and positive strides to get to the point where we are today.

This item was for informational purposes; no action was taken on Agenda Item No. 4.B.

5. BUSINESS ITEMS

Due to lack of quorum, Agenda Item Nos. 5.A and 5.B will be brought before the Committee for consideration at a future meeting.

6. ADJOURNMENT

The meeting came to a close at 12:26 p.m.

APPROVED: January 24, 2019

_____

Jasmin A. Hall, Convener

Attest:

_____

Kelly Berry, CMC, Clerk of the Board

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OWOW STEERING COMMITTEE MEMORANDUM NO. 2019.1

DATE: January 24, 2019

TO: OWOW Steering Committee

SUBJECT: Incorporating the Santa Ana River Parkway & Open Space Plan into the OWOW Plan Update 2018

PREPARED BY: Mark Norton, Water Resources and Planning Manager

RECOMMENDATION
It is recommended that the OWOW Steering Committee:

1) Receive presentations by SAWPA staff and the California Coastal Conservancy about the Santa Ana River Parkway & Open Space Plan (2018);

2) Incorporate the Parkway & Open Space Plan by reference in an appendix to the OWOW Plan update 2018

DESCRIPTION
The One Water One Watershed Plan serves many roles in the Santa Ana River watershed, chiefly as the approved Integrated Regional Water Management Plan for the Santa Ana Watershed Project Authority IRWM Region and the Santa Ana Funding Region within the Department of Water Resources Integrated Regional Water Management Program (IRWM).

Representatives from the California Coastal Conservancy, who were instrumental in the creation of the Santa Ana River Parkway & Open Space Plan (2018), will present the purpose and content of this plan, so that it may be incorporated into the OWOW Plan Update 2018 by reference.

Because the plan contains project concepts or a list of proposed projects, the "incorporation" of the plan does not also include automatic incorporation of those projects. Rather, for projects to be included in the OWOW Plan Update 2018 they must be submitted through the online OWOW Program Project Database. To facilitate this, SAWPA staff worked directly with the California Coastal Conservancy staff, following direction of the OWOW Steering Committee, to directly import lists of projects from this plan. This ensured that project proponents faced as little extra data entry as possible, and that the important work of the Parkway & Open Space Plan process was included in the OWOW Program.

BACKGROUND

The OWOW Program and the OWOW Plans acknowledge that watershed management occurs at multiple scales and is undertaken, encouraged or required by multiple policy frameworks. OWOW Plan Update 2018, like its predecessors, places integration at the center of the efforts to achieve watershed goals. Connecting other planning efforts related to water and land management, general plans, stormwater management plans, and urban water management plans, among others, is one key role for OWOW Plan Update 2018. As the plan for the watershed, it seeks not to reproduce what more specific plans have concluded or encouraged, but rather to express opportunities at the intersection of activities, and to provide detail on topics that haven't otherwise been addressed.

For this reason, the regional plan for the expansion of parkways and open space adjacent to the Santa Ana River is recommended to be incorporated into the OWOW Plan Update 2018. This incorporation will play two important roles. First, projects whose scopes blend water and watershed management with the provision of recreation and other benefits along the river may be identified and aligned, and, equally important, this integration may prevent unexpected interference with the project plans of related agencies in the watershed. Second, the Santa Ana River Parkway & Open Space Plan will have a greater platform to distribute information about the regional aims of the watershed as they relate to the expansion of parkways and open space along the banks of the Santa Ana River.

The Santa Ana River Parkway & Open Space Plan (2018):

"…facilitate[s] *the collaborative development of the Parkway beyond the trail spine, integrating parks and open space opportunities, and connecting nearby communities to the Santa Ana River Trail. The three key function of the plan are to:*

- *Define a shared vision for the Parkway as a state, regional, and local asset.*
- *Gather and present the first comprehensive list of completed, planned[,] and potential parkway projects.*
- *Provide tools for prioritizing, developing, and implementing projects through proactive collaboration."*

Attachments:
None.

OWOW STEERING COMMITTEE MEMORANDUM NO. 2019.2

DATE: January 24, 2019

TO: OWOW Steering Committee

SUBJECT: Incorporate the November 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan into the OWOW Plan Update 2018

PREPARED BY: Mark Norton, Water Resources and Planning Manager

RECOMMENDATION

It is recommended that the OWOW Steering Committee:

1) Receive a presentation from representatives of San Bernardino County about the November 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan; and,
2) Incorporate the 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan by reference in an appendix to the OWOW Plan Update 2018.

DESCRIPTION

The One Water One Watershed Plan serves many roles in the Santa Ana River watershed, chiefly as the approved Integrated Regional Water Management Plan for the Santa Ana Watershed Project Authority IRWM Region and the Santa Ana Funding Region within the Department of Water Resources Integrated Regional Water Management Program (IRWM).

SB 985 (Sen. Pavley - Agoura Hills), approved by the Governor on September 25, 2014, requires the development of a stormwater resource plan in order to receive grants for stormwater and dry weather runoff capture projects from any State bond measure approved by voters after January 1, 2014, such as the Proposition 1 Water Bond. Upon development of the stormwater resource plans, the planning area's Regional Water Management Group shall incorporate it into the Integrated Regional Water Management Plan. The OWOW Steering Committee has done this twice before, with the Orange County Stormwater Resources Management Plan, and the Chino Basin Stormwater Resources Plan.

SAWPA staff will work with San Bernardino County staff to ensure that projects submitted to this stormwater plan are incorporated into the OWOW Plan Update 2018.

BACKGROUND

The 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan describes its role this way:

> The intent of the SWRP is to develop a regional plan of stormwater resources to maximize benefits within the SBC portion of the SARW, an area of 1,015 square miles and home to nearly 2 million people, or about 80% of the overall population of the

county. The SBC SARW contains the headwaters of the Santa Ana River and the headwaters of many of its tributaries draining from the San Bernardino and San Gabriel Mountains. The SWRP establishes stormwater and dry-weather runoff goals and objectives for the entire SBC SARW to provide water quality, water supply, flood management, environmental, and community benefits. The intention of this SWRP is not to preclude a stakeholder from fulfilling their agency's primary mission, but to identify and prioritize multi-benefit projects when feasible.

ATTACHMENTS:

1. 2018 San Bernardino County Santa Ana River Watershed Stormwater Resource Plan – Cover, Table of Contents and Executive Summary.

SAN BERNARDINO COUNTY
PUBLIC WORKS

SAN BERNARDINO COUNTY
SANTA ANA RIVER WATERSHED
STORMWATER RESOURCE PLAN

1561 E. Orangethorpe Avenue, Suite 240
Fullerton, California 92831
(714) 526-7500
www.cwecorp.com

San Bernardino County
Santa Ana River Watershed
Stormwater Resource Plan

FINAL

Prepared for:

San Bernardino County Flood Control District
825 East Third Street
San Bernardino, California 92415
(909) 387-8119

Prepared by:

1561 E. Orangethorpe Avenue, Suite 240
Fullerton, California, 92831

TEL (714) 526-7500 | FAX (714) 526-7004 | www.cwecorp.com

November 2018

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Acronyms

AES	Advanced Engineering Software
AF	Acre-Feet
AFY	Acre-Feet per Year
AGR	Agricultural Supply
ASBI	Area of Special Biological Importance
ASBS	Areas of Special Biological Significance
BBL	Big Bear Lake
BBLN	Big Bear Lake Nutrient and Nuisance Aquatic Plants
BBMWD	Big Bear Municipal Water District
BMP	Best Management Practice
BPA	Basin Plan Amendment
BVMWC	Bear Valley Mutual Water Company
CASQA	California Stormwater Quality Association
CBRP	Comprehensive Bacteria Reduction Plan
CBWCD	Chino Basin Water Conservation District
CBWM	Chino Basin Watermaster
CDFW	California Department of Fish and Wildlife
CDS	Continuous Deflection Separator
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
COLD	Cold Freshwater Habitat
CRAM	California Rapid Assessment Methods
CTR	California Toxics Rule
CWA	Clean Water Act
DAC	Disadvantaged Community
DDT	Dichlorodiphenyltrichloroethane
EIR	Environmental Impact Report
ESA	Endangered Species Act
EVWD	East Valley Water District
FCS	Full Capture Systems
GAC	Granular Activated Carbon
GIS	Geographic Information System
GWR	Groundwater Recharge
HEC-HMS	Hydrologic Engineering Center – Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center – River Analysis System
HSPF	Hydrological Simulation Program – Fortran
IEUA	Inland Empire Utilities Agency
IGP	Industrial General Permit
IRWM	Integrated Regional Water Management

IRWMP	Integrated Regional Water Management Plan
IS	Initial Study
ISWEBE	Inland Surface Waters, Enclosed Bays, and Estuaries
LA	Load Allocation
MCL	Maximum Contaminant Level
MND	Mitigated Negative Declaration
MS4	Municipal Separate Storm Sewer System
MSAR	Middle Santa Ana River
MUN	Municipal and Domestic Water Supply
MWD	Metropolitan Water District of Southern California
MZ	Management Zones
ND	Negative Declaration
NGO	Non-Governmental Organization
NL	Notification Level
NPDES	National Pollutant Discharge Elimination System
OAL	Office of Administrative Law
OCWD	Orange County Water District
OWOW	One Water, One Watershed
OWTS	Onsite Wastewater Treatment Systems
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethylene
POTW	Publicly-Owned Treatment Works
POW	Hydropower Generation
QAPP	Quality Assurance Program Plan
RARE	Rare, Threatened, or Endangered Species
RCP	Reinforced Concrete Pipe
REC1	Water Contact Recreation
REC2	Water Non-contact Recreation
RHWC	Riverside Highland Water Company
ROWD	Report of Waste Discharge
SANBAG	San Bernardino Associated Governments
SARW	Santa Ana River Watershed
SARWQCB	Santa Ana Regional Water Quality Control Board
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SBC	San Bernardino County
SBCDPW	San Bernardino County Department of Public Works
SBCFCD	San Bernardino County Flood Control District
SBMWD	San Bernardino Municipal Water District
SBPAT	Structural Best Management Practice Prioritization and Analysis Tool
SBVMWD	San Bernardino Valley Municipal Water District
SBVWCD	San Bernardino Valley Water Conservation District
SCS	Soil Conservation Service
SDWA	Safe Drinking Water Act

SPOEEP	Stakeholder and Public Outreach, Education, and Engagement Plan
SPWN	Spawning, Reproduction, and Development
SUSTAIN	System for Urban Stormwater Treatment and Analysis Integration
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Stormwater Management Model
SWRCB	State Water Resources Control Board
SWRP	Stormwater Resource Plan
TAC	Technical Advisory Committee
TCE	Trichloroethylene
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UA	Unincorporated Areas
UAA	Use Attainability Analyses
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VOCs	Volatile Organic Compounds
WARM	Warm Freshwater Habitat
WEI	Wildermuth Environmental, Inc.
WILD	Wildlife Habitat
WLA	Waste Load Allocation
WLAM	Wasteload Allocation Model
WMS	Watershed Modeling System
WMWD	Western Municipal Water District
WQO	Water Quality Objective
WSPG	Water Surface Pressure Gradient
WWTP	Wastewater Treatment Plant
WVWD	West Valley Water District
YVWD	Yucaipa Valley Water District

Executive Summary

This Stormwater Resource Plan (SWRP) was prepared to develop a regional, watershed-based plan for management and improvement of stormwater resources within the Santa Ana River Watershed (SARW) portion of San Bernardino County (SBC). This SWRP is a document that complies with the requirements and guidelines set forth by the State Water Resources Control Board (SWRCB) mandated by Senate Bill 985 (SB 985), passed by the California State Legislature and signed into law by Governor Jerry Brown on September 25, 2014.

The intent of the SWRP is to develop a regional plan of stormwater resources to maximize benefits within the SBC portion of the SARW, an area of 1,015 square miles and home to nearly 2 million people, or about 80% of the overall population of the county. The SBC SARW contains the headwaters of the Santa Ana River and the headwaters of many of its tributaries draining from the San Bernardino and San Gabriel Mountains. The SWRP establishes stormwater and dry-weather runoff goals and objectives for the entire SBC SARW to provide water quality, water supply, flood management, environmental, and community benefits. The intention of this SWRP is not to preclude a stakeholder from fulfilling their agency's primary mission, but to identify and prioritize multi-benefit projects when feasible.

The SBC SARW SWRP includes a section on the water quality objectives within the watershed. Meeting existing water quality objectives is an important component of the SWRP. Existing planning efforts have been identified, as the intent of the SWRP is not to replace existing efforts, but rather to work in conjunction with existing goals already defined in regulations and planning efforts. Stakeholders were identified, along with a process for collaborating with organizations, stakeholders, and the public.

The SWRP contains a number of potential stormwater and dry-weather runoff projects. The types of projects include low-flow capture, infiltration basins, channel improvements, bioretention projects, habitat remediation, public use areas, and green streets projects. Each project included provides multiple benefits to the community and contributes towards the achievement of stormwater goals and objectives. The multiple benefits are quantified and projects are prioritized based on an integrated metrics-based analysis. An implementation strategy and a rough estimation of a schedule for each project is included in the plan.

The SWRP was prepared with community and stakeholder involvement at each step of the process. The outreach, collaboration, and educational components are summarized within the SWRP. The SWRP is a living document which can be used for many years and will be adaptively managed based on the changing needs and resource goals within the SBC SARW. The SWRP will be submitted to the Santa Ana Watershed Protection Authority (SAWPA) for inclusion in their One Water, One Watershed (OWOW) Plan.

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OWOW STEERING COMMITTEE MEMORANDUM NO. 2019.3

DATE: January 24, 2019

TO: OWOW Steering Committee

SUBJECT: OWOW Plan Update 2018 Sustainability Assessment

PREPARED BY: Mike Antos, Senior Watershed Manager

RECOMMENDATION
It is recommended that the OWOW Steering Committee receive and file this final report about the OWOW Plan Update 2018 Sustainability Assessment.

DESCRIPTION
During development of the California Water Plan Update 2018, DWR supported two pilot applications of a component of their Sustainability Outlook, one here in the Santa Ana River Watershed. OWOW Program and SAWPA are among early adopters of using watershed assessment tools to understand progress and performance towards planning targets. Integrated water management is very complex and is a shared enterprise. Understanding if all the disparate and collaborative management actions are together achieving progress towards shared goals is a key to good management. That broad understanding, however, remains very difficult to achieve and maintain over time.

SAWPA is very proud to have been selected for this partnership with DWR and recognizes how the benefits of the effort will accrue both to the watershed and to the State. The consultant team here today will present their completed work for the OWOW Program, and its relationship to the California Water Plan Update 2018.

BACKGROUND
The Sustainability Assessment was crafted to provide feedback to decision-makers and stakeholders of the One Water One Watershed (OWOW) Plan regarding how well Plan goals are being achieved. This feedback will inform where additional or modified emphasis and investment is needed to realize the goals of the OWOW Plan. Unlike the California Water Plan Update 2018, which focused on developing a tool for assessing the effectiveness of water management for sustainability (the Sustainability Outlook), the OWOW Plan Update 2018 developed goals focused on improving watershed sustainability.

Because this assessment was conducted while the California Water Plan Update 2018 and OWOW Plan Update 2018 were being developed, it may not fully conform to the final versions of either document.

The Sustainability Assessment was developed with input from stakeholders and decision-makers, though the engagement was limited due to its parallel execution with the drafting of the OWOW Plan Update 2018. The Sustainability Assessment, as designed, supports collaborative dialogue,

prioritization, and further analysis – it is not intended to be a comprehensive and exhaustive analysis of watershed condition. More comprehensive work is done routinely elsewhere, driven by specialty activity and carried out by technical experts. This tool draws from such work, but it does not seek to replicate it nor encompass its full complexity. The simple rating system used supports the purpose of the Sustainability Assessment as a quick reference overview of an extraordinarily complex and multi-faceted system of natural and human processes.

In summary, this Sustainability Assessment is the initial iteration of a tool intended to be useful to the OWOW Plan stakeholders in guiding Plan implementation. Future work can further refine its utility to the region and deepen the connections to the California Water Plan Sustainability Outlook tools as they develop.

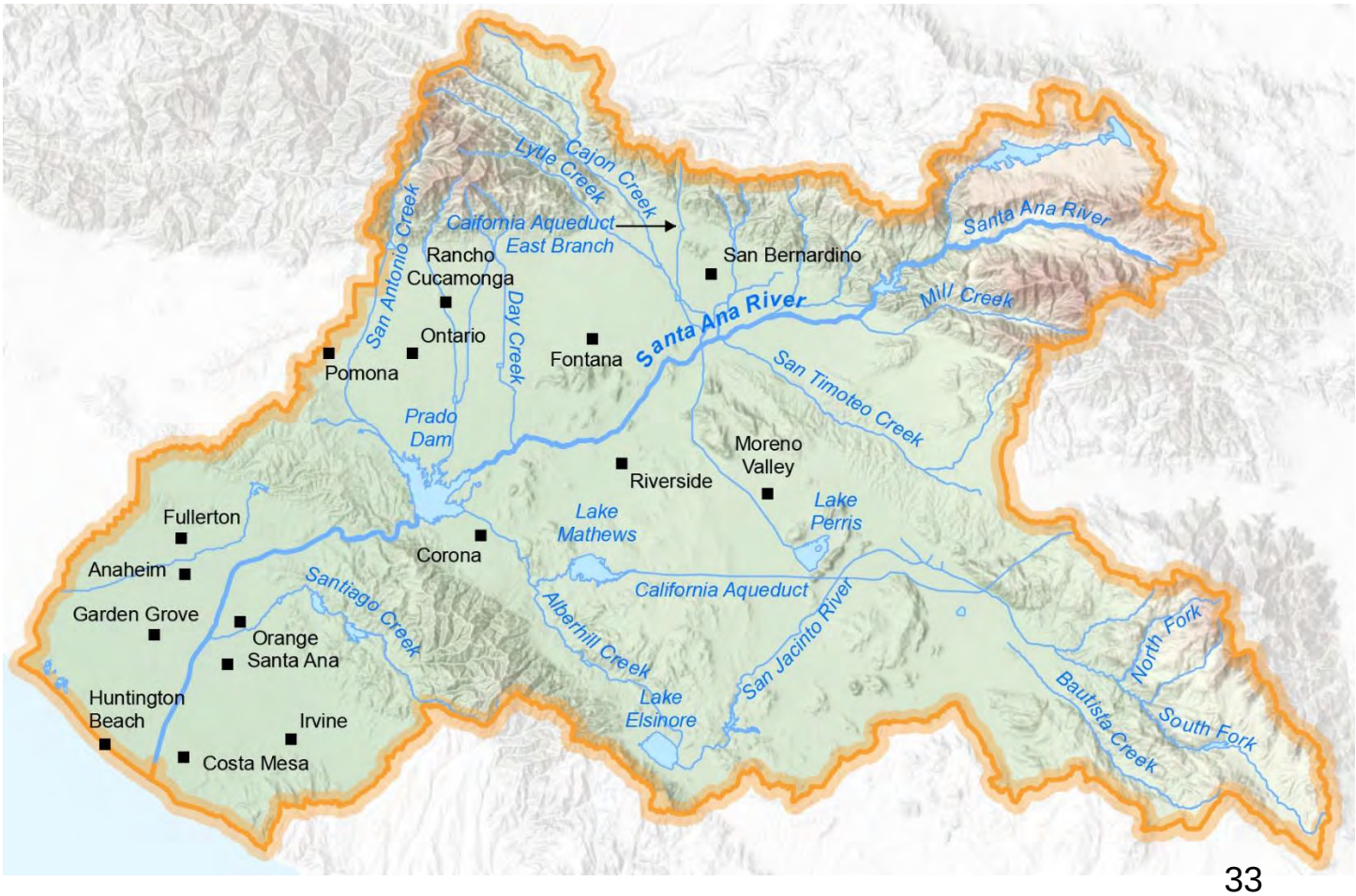
ATTACHMENTS:

1. OWOW Plan Update 2018 Watershed Sustainability Assessment

OWOW PLAN UPDATE 2018
WATERSHED SUSTAINABILITY ASSESSMENT

Prepared for
Santa Ana Watershed Project Authority
and California Department of Water
Resources

January 2019



OWOW PLAN UPDATE 2018
WATERSHED SUSTAINABILITY ASSESSMENT

Prepared for
Santa Ana Watershed Project Authority
and California Department of Water
Resources

January 2019

1425 N. McDowell Boulevard
Suite 200
Petaluma, CA 94954
707.795.0900
www.esassoc.com

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FOREWORD

The Sustainability Assessment that follows was developed by Environmental Science Associates (led by Betty Andrews and Karen Lancelle) in collaboration with Peter Vorster of The Bay Institute, working with the Santa Ana Watershed Project Authority. It was made possible with the financial support of the California Department of Water Resources as a pilot effort to demonstrate a regional sustainability assessment as encouraged by recent and current versions of the California Water Plan.

The Sustainability Assessment was crafted to provide feedback to decision-makers and stakeholders of the One Water One Watershed (OWOW) Plan regarding how well Plan goals are being achieved. This feedback will inform where additional or modified emphasis and investment is needed to realize the goals of the OWOW Plan. Unlike the California Water Plan Update 2018, which focused on developing a tool for assessing the effectiveness of water management for sustainability (the Sustainability Outlook), the OWOW Plan Update 2018 developed goals focused on improving watershed sustainability.

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In summary, this Sustainability Assessment is the initial iteration of a tool intended to be useful to the OWOW Plan stakeholders in guiding Plan implementation. Future work can further refine its utility to the region and deepen the connections to the California Water Plan Sustainability Outlook tools as they develop.

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Introduction

This document provides a summary of the watershed sustainability assessment developed and conducted for the OWOW Plan Update 2018. A brief introduction to the assessment is provided, including a discussion of its purpose and goals; background on other watershed sustainability assessments that informed its development; discussion on the principles that were applied during its development; an overview of the indicators and metrics selected for the assessment; a brief introduction to its implementation; and a summary of the assessment findings, first in a table form and then as individual pages presenting each metric evaluated.

A more detailed presentation of the implementation of each metric evaluation is contained in **Attachment A**, including a discussion of data sources, approach to scoring and rating, detailed implementation steps, and considerations for future iterations of the assessment.

Purpose and Goals

The primary purpose of the watershed sustainability assessment for the OWOW Plan Update 2018 is to help promote sustainability within the Santa Ana River watershed by supporting decision making and stakeholder action to achieve the goals of the OWOW Plan. By providing feedback on how well the OWOW Plan goals are being achieved, decision making can adapt to provide increased resources and attention where it is needed.

At the watershed scale, the watershed sustainability assessment supports decision making by demonstrating whether or not existing efforts are showing progress towards meeting goals. It will additionally inform future projects and planning efforts by helping to focus attention on meaningful objectives, identifying activities that are needed to shift key indicators. The sustainability assessment can also support the effectiveness of the Plan itself. It provides a measuring stick for each iteration of the OWOW Plan; if it is found that the effects of implementing the OWOW Plan are successful based on the findings of the sustainability assessment, but fail to address key aspects of sustainability still challenging the watershed, modification of the OWOW Plan's goals and objectives should follow.

At the individual scale, by providing a vehicle for a shared understanding of progress toward the shared goals expressed in the OWOW Plan, the watershed sustainability assessment also helps to build a sense of common purpose among watershed stakeholders, which can multiply the collective effect of their individual decisions, including support for watershed-scale actions.

With sufficient ease of implementation, the performance feedback provided by the assessment can be carried out more often than at each plan update, perhaps even annually, to 1) help refine implementation of the Plan on a time scale that will be regularly meaningful to decision-makers, 2) build momentum around demonstrating progress towards the goals, and 3) serve to reinforce the value of the Plan and its implementation to the stakeholders in the watershed.

Background

Over the past two decades in California, multiple statewide and regional efforts have emerged to develop and apply indicator-based assessment frameworks and tools to help manage water resources for sustainability. Sustainability frameworks and visions were included in the California Water Plan (CWP) updates from 2005 through 2018 and in the 2013 iteration of the One Watershed One Water (OWOW) Program. In addition to these public programs, the Sustainable Water Management Profile, an assessment tool prepared for the Water Foundation, was developed in 2012.

As part of the 2013 iteration of the OWOW Program, also called the OWOW 2.0 Plan, a Sustainability Indicators Framework was used to understand the performance of integrated water management in the watershed. The results were published in Appendix A of the OWOW 2.0 Plan as an "Assessment of the Health of Santa Ana River Watershed." The Sustainability Indicators Framework was designed to integrate sustainability indicators and performance measures into a single reporting system.

The sustainability assessment frameworks developed since 2010 and the other frameworks applied at the watershed scale over the last 20 years in California were analyzed, along with the draft California Water Plan Update 2018 "Sustainability Outlook[1]," to develop an assessment framework with metrics and indicators for the OWOW Plan Update 2018.

Development

As described in the Background section above, statewide and regional efforts to develop sustainability assessment tools have been ongoing for more than a decade. Assessment development for the OWOW Plan Update 2018 intentionally utilized concepts and indicators identified by these previous and concurrent efforts as a potential source for indicators and metrics aligned with the OWOW Plan's goals and objectives, which were developed through local collaborative watershed planning efforts. The intent of this strategic approach was to develop an assessment that reflected the best thinking related to managing water for sustainability while ensuring that the assessment results would be locally meaningful and time- and cost-effective to repeat on a regular basis.

The development of a sustainability assessment for the OWOW Plan Update 2018 recognized that pursuit of sustainability is a process. It also reflected the understanding that, while the pursuit of sustainability is often considered as overcoming a combination of technical challenges, in most settings it is more appropriately recognized as overcoming a combination of political challenges. Watershed sustainability assessment tools are powerful if used to specifically respond to these political challenges. Technical assessment of a thousand nuanced aspects of water sustainability does not address political challenges; it.is simply a collection of what various specialists already know, and it obscures the holistic picture that is needed to harness political will. These considerations influenced the approach to development of the OWOW Plan Update 2018

[1] The proposed Sustainability Outlook includes a still-developing suite of indicators that can be used to assess conditions and trends in water and watershed management.

sustainability assessment as well as the selection of its indicators and metrics. The list of indicators and metrics needed to be relatively short, and the metrics themselves needed to be easy for stakeholders to understand, directly responsive to actions to achieve the goals of the OWOW Plan, and practical to evaluate on a regular basis.

The assessment was developed based on the OWOW Plan Update 2018 goals and objectives (goals listed in **Table SA-1**). The OWOW Plan Update 2018 describes how collaborative watershed planning, water and land management, and project implementation support improved sustainability, resilience, and quality of life throughout the Santa Ana River Watershed through 2040.

TABLE SA-1
OWOW PLAN UPDATE 2018 GOALS

Achieve resilient water resources through innovation and optimization.	Ensure high quality water for all people and the environment.
Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function.	Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed.
Educate and build trust between people and organizations.	Educate and build trust between people and organizations.

Components of the assessment framework include indicators and metrics, valuation or scoring, and presentation of results in the form of a rating.

Indicators and their associated metrics were selected by reviewing indicators previously identified for other projects (and regions) and screening them to reflect the Santa Ana River watershed and adopted criteria related to ease of implementation. OWOW stakeholder feedback was sought at multiple stages during the assessment development process. Sets of potential indicators were shared during local stakeholder meetings to solicit feedback and share progress.

The array of potential indicators was narrowed to a select group for further consideration based on four main criteria: easy to understand; responsive to actions; easy to implement; and meaningful to stakeholders.

The assessment reports on trends (that is, scores are relative to past performance) instead of scoring each indicator with either an absolute value or based on its relationship to a target condition (i.e., wanted or unwanted conditions). A three-bin set of results -- a positive trend, a negative trend, or a neutral condition – were elected for the assessment because these three outcomes are easy to understand, limit the number of scoring thresholds to be assigned, and are adequate to indicate movement toward Plan goals.

Table SA-2 lists the selected indicators and metrics associated with each of the six OWOW Plan Update 2018 goals and provides a short rationale for each.

TABLE SA-2
SELECTED INDICATORS FOR OWOW UPDATE GOALS

Goal	Indicator	Metric	Rationale
Achieve resilient water resources through innovation and optimization	Maximization of locally-managed supplies	Percent of total annual supply sourced or managed locally	Water that is sourced locally or imported and stored locally is more reliable than water that is imported and must be immediately used. Maximizing local supplies and storage in the region will make us more resilient and effective managers of an increasingly variable water supply.
	Efficiency of outdoor water use	Percent of watershed population in agencies using parcel-level data to assess outdoor water use	Implementing innovative technology and data management can increase irrigation efficiency and help make landscapes less irrigation dependent. Landscape irrigation is the single largest use of water in the watershed and improving its efficiency will significantly increase watershed resilience.
Ensure high quality water for all people and the environment.	Maintenance of groundwater salinity at or below target levels	Non-exceedance of groundwater salinity standards	Management of water quality in the groundwater basins of the watershed is essential to preserving their utility. Groundwater basins are the watershed's most important local water storage tool, and salinity levels are a primary consideration for maintaining a high-quality, reliable water supply.
	Safety of water for contact recreation	Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination	Bathers in our streams, lakes, and coastal waters must be protected from undue health hazards from water quality impairment.
Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	Abundance of vegetated riparian corridor	Area of vegetated riparian corridor	Active engagement in conserving and restoring riparian vegetation is necessary to retaining and enhancing the values supported by this resource. Vegetation within the riparian corridors of the watershed provides valuable habitat for a large number of species, including those with special status. It also provides beauty and shade for people recreating alongside streams and lakes.
	Abundance of conserved open space	Area of conserved open space	Deliberate management and protection is necessary to maintain the recreational and ecosystem values of open space.
Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	Equitable access to clean drinking water	Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community	Ensuring that all people in the watershed have clean drinking water is essential to human health and prosperity within the watershed.
	Proportionate implementation of climate change adaptation strategies	Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community	Targeted implementation of climate change adaptation strategies that address the potential for increased dangerous heat, a climate change impact predicted in the watershed, will reduce the extent to which vulnerable people are inequitably impacted.
Educate and build trust between people and organizations.	Collaboration for more effective outcomes	Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation	Collaborative action with shared outcomes must be prioritized by water managers because many of the complex challenges facing the watershed cannot be overcome by a single organization.

TABLE SA-2
SELECTED INDICATORS FOR OWOW UPDATE GOALS

Goal	Indicator	Metric	Rationale
	Adoption of a watershed ethic	Total gallons of potable water used per capita per day	Helping conservation become a way of life in California involves education and civic action. As more water users learn how precious our water and watershed are, many of the challenges will be more easily overcome.
Improve data integration, tracking and reporting to strengthen decision-making	Broaden access to data for decision-making	Percent of watershed population in agencies whose residential customers receive relative performance information about their water use	Everyone who uses water is a decision-maker. Informing people how they are using water relative to past and/or budgeted use, will improve decisions, increase efficiency, and make us more resilient.
	Participation in an open data process	Percent of watershed population in agencies participating in establishment of a regional data sharing system	Our ability to create data is outstripping our ability to make effective use of it. Ensuring that data produced is meaningful, is applied to decision-making, and is shared freely without jeopardy is a critical next step for the management of the watershed's supply and demand.

Implementation

After selecting the metrics, a few additional decisions remained to be made for their implementation. The decisions included:

- determining the extent of change that would count toward the trend evaluation (e.g., what change in area of open space would be sufficient to consider a trend to be positive),
- how to handle assessment of metrics for which a simple trend assessment approach was not appropriate (e.g., groundwater quality in a managed, maximum benefit environment),
- which data sources to use and how (e.g., should comparisons be made to the prior year alone or to a multi-year average), and
- methods to combine results for discrete elements (e.g., groundwater basins) to reflect an overall score.

These choices were influenced by data quality and availability as well as expert judgment and assessment of meaningfulness to assessment consumers. In many cases earlier data was not available to address the trend. If such comparable data was not available, the metric value was assessed qualitatively based upon expert judgement, and contextualized using other data.

Target conditions (wanted or unwanted conditions) were not established for this assessment. To be meaningful in a planning context, target conditions must be developed through a collaborative process by the OWOW Plan 2018 Update stakeholders. While at this time the indicators are not evaluated relative to target conditions, this could be carried out in the future, should those conditions be identified.

Two types of scoring emerged, based on the metric being assessed. A positive or negative trend based on either decrease or increase in the metric value was an appropriate basis for scoring for most metrics (such as total gallons of potable water used per capita per day). In other cases, a good-bad scoring approach was used. The good-bad scoring approach was developed to address metrics for which a binary valuation (either a condition is good or bad) exists and is a more appropriate basis for establishing an assessment rating. For example, increases in groundwater salinity from one year to the next would not necessarily be considered a negative trend if the salinity remains below water quality target levels. Further, maintenance of a consistent salinity level below the water quality target was appropriately considered a positive outcome, despite not reflecting a trend in salinity levels.

Attachment A includes a description of the implementation approach for each indicator and metric, along with information about data used, method of implementation, results, the rating, and recommendations for future implementation.

Outcomes

The OWOW Sustainability Assessment Summary presents the outcomes of this assessment in a tabular form. The rating represents the evaluation of management action effectiveness in the pursuit of sustainability. The Sustainability Assessment Summary provides a succinct visual high-level "status update" of the watershed and feedback on OWOW Plan effectiveness. **Table SA-3** provides a key to the rating system used to summarize findings.

A series of Assessment Summary Sheets follow the Sustainability Assessment Summary table and present each metric, rationale, and findings in a simplified graphical format.

TABLE SA-3
RATING SYSTEM KEY

Rating	Quantitative Assessment Rating	Qualitative Assessment Rating
Positive		
Neutral		
Negative		

OWOW Sustainability Assessment Summary

Goal	Indicator	Metric	Rating*	Scoring
Achieve resilient water resources through innovation and optimization	Maximization of locally-managed supplies'	Percent of total annual supply sourced or managed locally		Trend scoring approach. Potentially fully scorable data set if data can be rectified. Qualitative trend assessment - inadequate data available.
	Efficiency of outdoor water use	Percent of watershed population in agencies using parcel-level data to assess outdoor water use		Trend scoring approach. One partial data set: incomplete assessment of all watershed retailers and how parcel-level data is actually used. Qualitative trend assessment - only one data point.
Ensure high quality water for all people and the environment	Maintenance of groundwater salinity at or below target levels	Non-exceedance of groundwater salinity standards		Good-bad scoring approach. Fully scoring using quantitative data. Compare most recent (2015) to average triennial quantitative data 2003-2012.
	Safety of water for contact recreation	Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination		Good-bad scoring approach. Fully scoring using quantitative data.
Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	Abundance of vegetated riparian corridor	Area of vegetated riparian corridor		Trend scoring approach. Fully scoring based on quantitative data. Compare to average of prior 5 years of data.
	Abundance of conserved open space	Area of conserved open space		Trend scoring approach. Fully scoring based on quantitative data. Compare 2017 to 2016 data.
Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	Equitable access to clean drinking water	Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community		Trend scoring approach. Qualitative trend assessment - only one data point.
	Proportionate implementation of climate change adaptation strategies	Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community		Trend scoring approach. Qualitative trend assessment - only one data point.
Educate and build trust between people and organizations	Collaboration for more effective outcomes	Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation		Good-bad scoring approach. Fully scoring based on quantitative data. Compare 2017 to 2016 data.
	Adoption of a watershed ethic	Total gallons of potable water used per capita per day		Trend scoring approach. Fully scoring based on quantitative data. Compare to average of prior 10 years of data.
Improve data integration, tracking and reporting to strengthen decision-making	Broaden access to data for decision-making	Percent of watershed population in agencies whose residential customers receive relative performance information about their water use		Trend scoring approach. Qualitative trend assessment - only one data point.
	Participation in an open data process	Percent of watershed population in agencies participating in establishment of a regional data sharing system		Trend scoring approach. Qualitative trend assessment - inadequate data available.

*A face with hat indicates that the rating results from a qualitative assessment.

OWOW SUSTAINABILITY ASSESSMENT

Summary Sheets

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GOAL:

Achieve resilient water resources through innovation and optimization

SAWPA

Indicator:
Maximization of locally-managed supplies

Metric:
Percent of total annual supply sourced or managed locally

- Sufficient quantitative data was not available to assess this metric, and qualitative information was not available to determine whether the rating should be positive or negative. The metric was therefore given a qualitative neutral rating.
- Data from individual SAWPA wholesalers and the MWD service area for the last 10+ years show an increasing reliance on locally managed supplies resulting from the long-term trend of increased recycled water and groundwater recovery production in combination with demand reductions, increased efficiencies, and opportunistic recharge of local and imported water.
- A cooperative effort by SAWPA water supply agencies with the State and local agencies to whom the data is reported is needed to produce the quality data necessary to quantitatively assess this metric.

Why Evaluate this Indicator?

Water that is sourced locally or imported and stored locally is more reliable than water that is imported and must be immediately used. Maximizing local supplies and storage in the region will make us more resilient and effective managers of an increasingly variable water supply.

Insufficient Data

GOAL:

Achieve resilient water resources through innovation and optimization

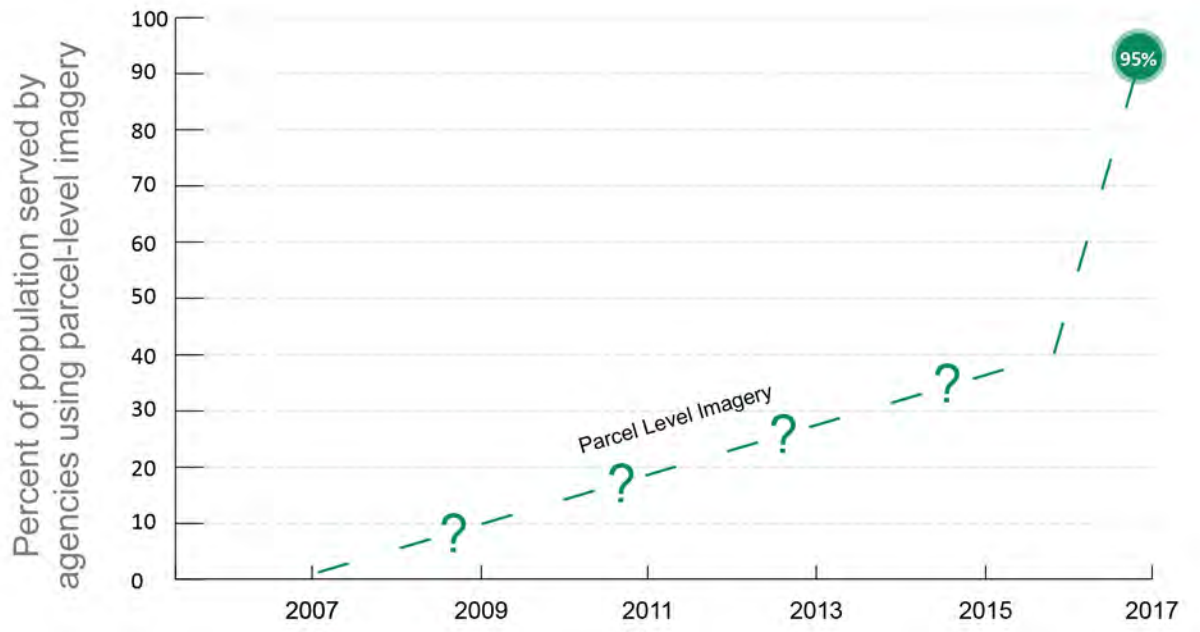
SAWPA

Indicator:	Metric:
Efficiency of outdoor water use	Percent of watershed population in agencies using parcel-level data to assess outdoor water use

- By 2017, the water supply and management agencies that together encompass 95% of the watershed's population requested the use of SAWPA-procured 2015 aerial imagery, which can be used for parcel-level assessments of outdoor water use. The retail water suppliers that encompass 74% of the watershed's population also either use or requested the use of the imagery.
- Quantitative information about the use of imagery procured prior to 2015 was not available and thus the trend assessment is qualitative.
- Beginning in 2007, SAWPA has obtained aerial imagery on behalf of the Santa Ana watershed, a noteworthy example of cooperative procurement to reduce costs for individual water suppliers and to assist them to improve the implementation, measurement of, and education about outdoor water use efficiency programs and conservation rate structures.

Why Evaluate this Indicator?

Implementing innovative technology and data management can increase irrigation efficiency and help make landscapes less irrigation dependent. Landscape irrigation is the single largest use of water in the watershed and improving its efficiency will significantly increase watershed resilience.



GOAL:

Ensure high quality water for all people and the environment.

SAWPA

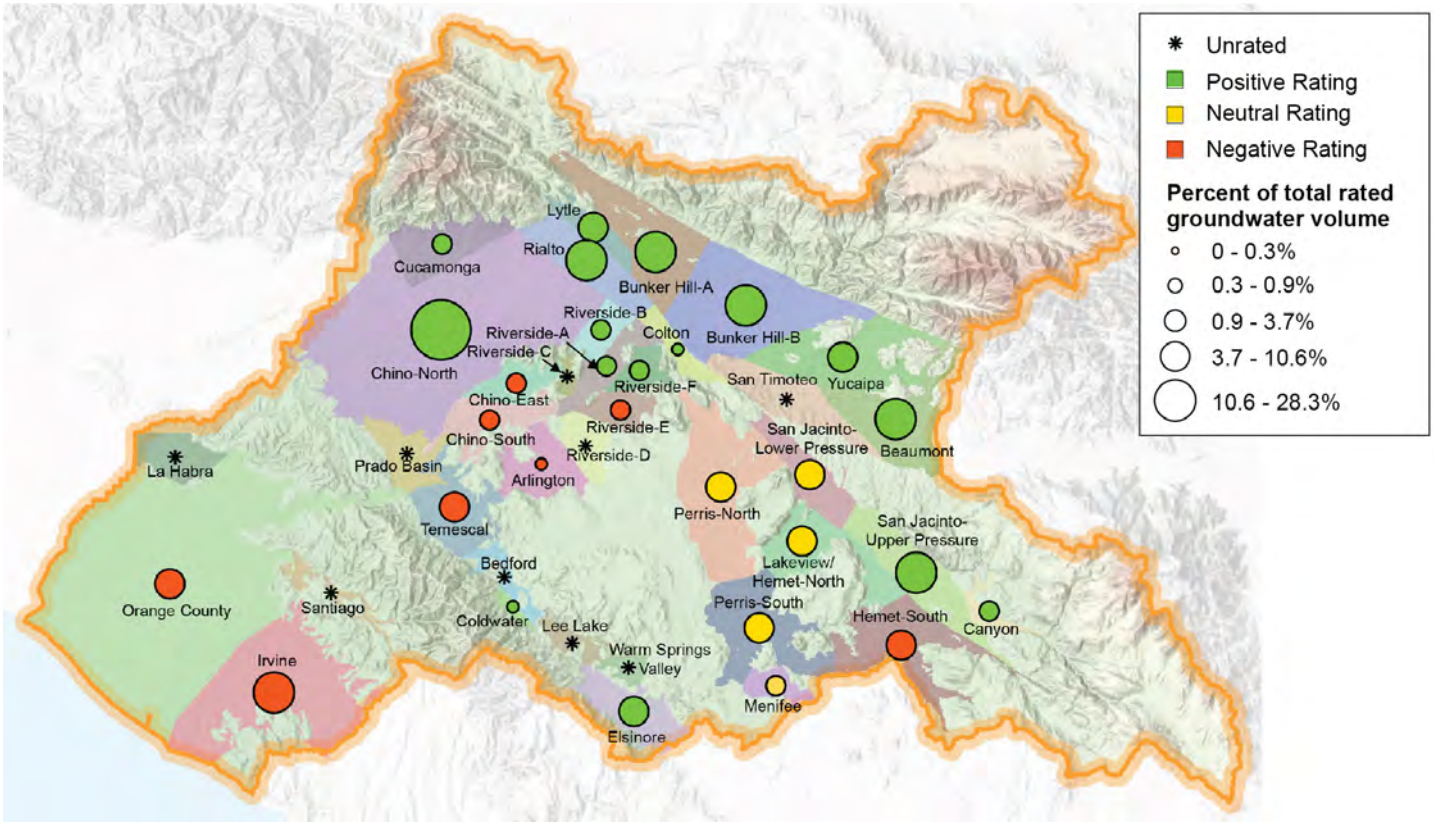
Indicator:
Maintenance of groundwater salinity at or below target levels

Metric:
Non-exceedance of groundwater salinity standards

- Of the 29 (out of 37 total) managed groundwater zones for which sufficient data exists for evaluation 55%, have salinity levels at the level of the salinity standard or better; when the results are weighted by volume in storage in each zone, the result rises to 71%.
- Overall, 82% of the rated groundwater volume either meets the water quality standard, or fails to meet the standard but has significantly improved compared to recent historic values.
- Salinity within the groundwater basins of the watershed has increased somewhat since 2012, just prior to the conditions described in the last OWOW Plan.

Why Evaluate this Indicator?

Management of water quality in the groundwater basins of the watershed is essential to preserving their utility. Groundwater basins are the watershed's most important local water storage tool, and salinity levels are a primary consideration for maintaining a high-quality, reliable water supply.



GOAL:

Ensure high quality water for all people and the environment.

SAWPA

Indicator:

Safety of water for contact recreation

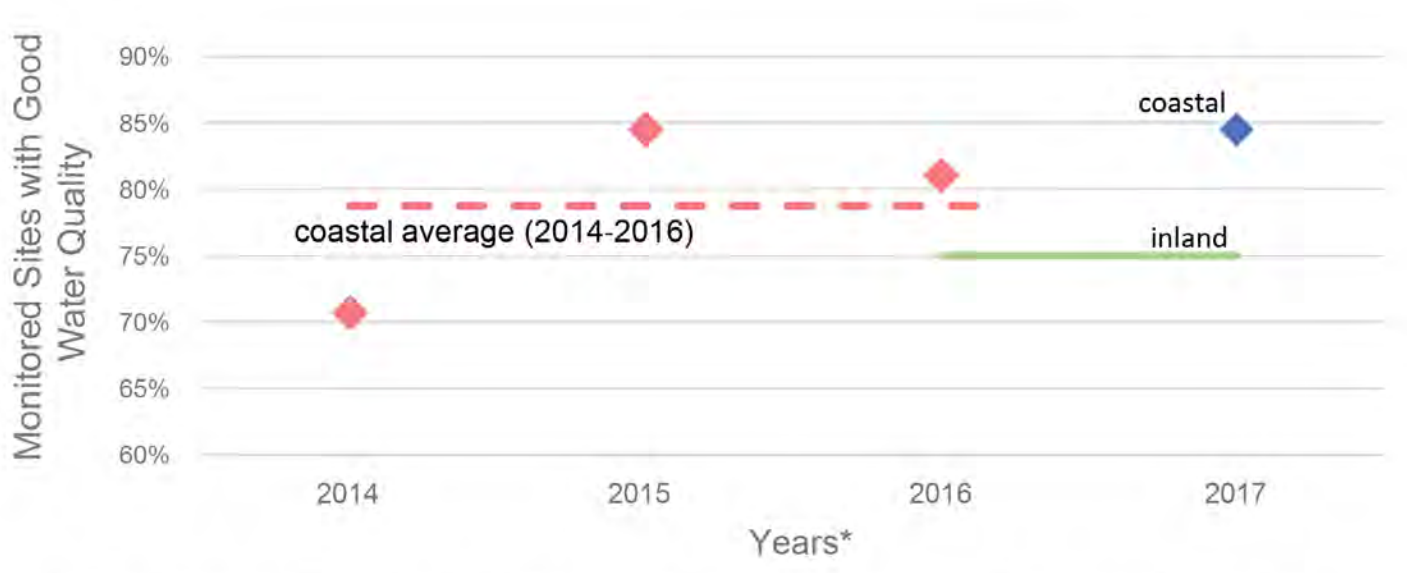
Metric:

Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination

- In 2017-2018, 84% of coastal sites received a good (A or A+) rating during dry season flows, while an additional 12% were lower quality, but improving, whereas only 63% of inland sites were generally compliant with the water quality objective and an additional 13% (one site) was noncompliant but showed significant improvement. Overall, this was determined to indicate a positive rating.
- The average 2017-2018 coastal dry season water quality grades were better than the average for the preceding three years; average inland water quality compliance was the same compared to the preceding year, the only other year for which data was available, but showed improved water quality.
- Since the last OWOW Plan was issued in 2014, coastal dry season water quality grades have improved overall.

Why Evaluate this Indicator?

Bathers in our streams, lakes, and coastal waters must be protected from undue health hazards from water quality impairment.



*Runoff Year (Apr - Mar); year identified is that which includes the majority of months in the sequence.

GOAL:

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function

SAWPA

Indicator:
Abundance of vegetated riparian corridor

Metric:
Area of vegetated riparian corridor

- In 2017, there are an estimated 21,727 acres of vegetated riparian corridor in the watershed, which is 1,209 more acres than were estimated for the preceding five-year period, 2012-2016. Due to this significant increase in area of vegetated riparian corridor, the indicator was given a positive rating.
- Riparian vegetation covers just under half of the riparian corridors in the watershed.
- Since 2013, the conditions that formed the basis for the last OWOW Plan, the estimated area of vegetated riparian corridor in the watershed has increased by 2,040 acres.

Why Evaluate this Indicator?

Active engagement in conserving and restoring riparian vegetation is necessary to retaining and enhancing the values supported by this resource. Vegetation within the riparian corridors of the watershed provides valuable habitat for a large number of species, including those with special status. It also provides beauty and shade for people recreating alongside streams and lakes.

GOAL:

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function

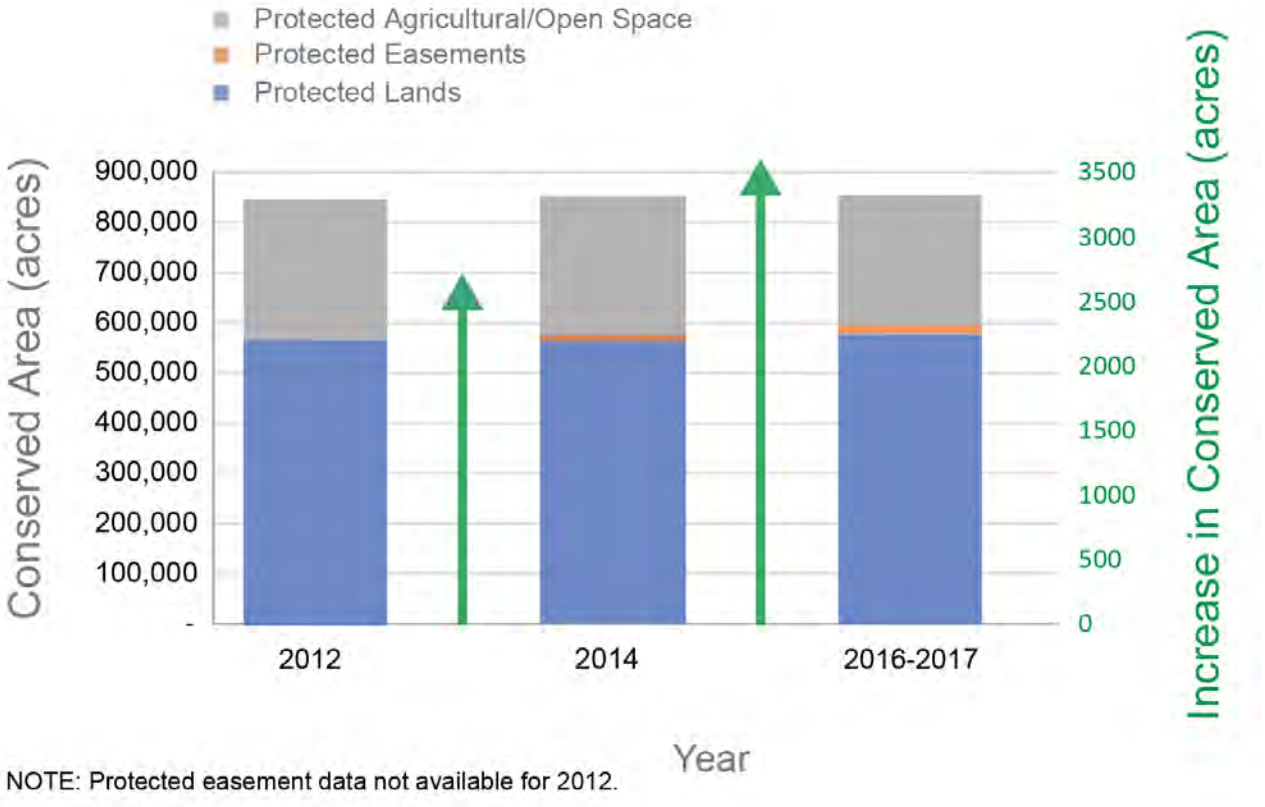
SAWPA

Indicator:	Metric:
Abundance of conserved open space	Area of conserved open space

- The estimated area of conserved open space in the watershed has increased by 3,633 acres since 2014, the most recent year for which data is available for comparison. Due to this significant increase in area of conserved open space, the indicator was given a positive rating.
- The 855,501 acres of conserved open space estimated for 2016-2017 is just under half of the area within the watershed.
- Since 2012, just before the last OWOW Plan was completed, more than 6,000 acres of conserved open space have been added to the roster of such lands in the watershed.

Why Evaluate this Indicator?

Deliberate management and protection is necessary to maintain the recreational and ecosystem values of open space.



NOTE: Protected easement data not available for 2012.

GOAL:

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed

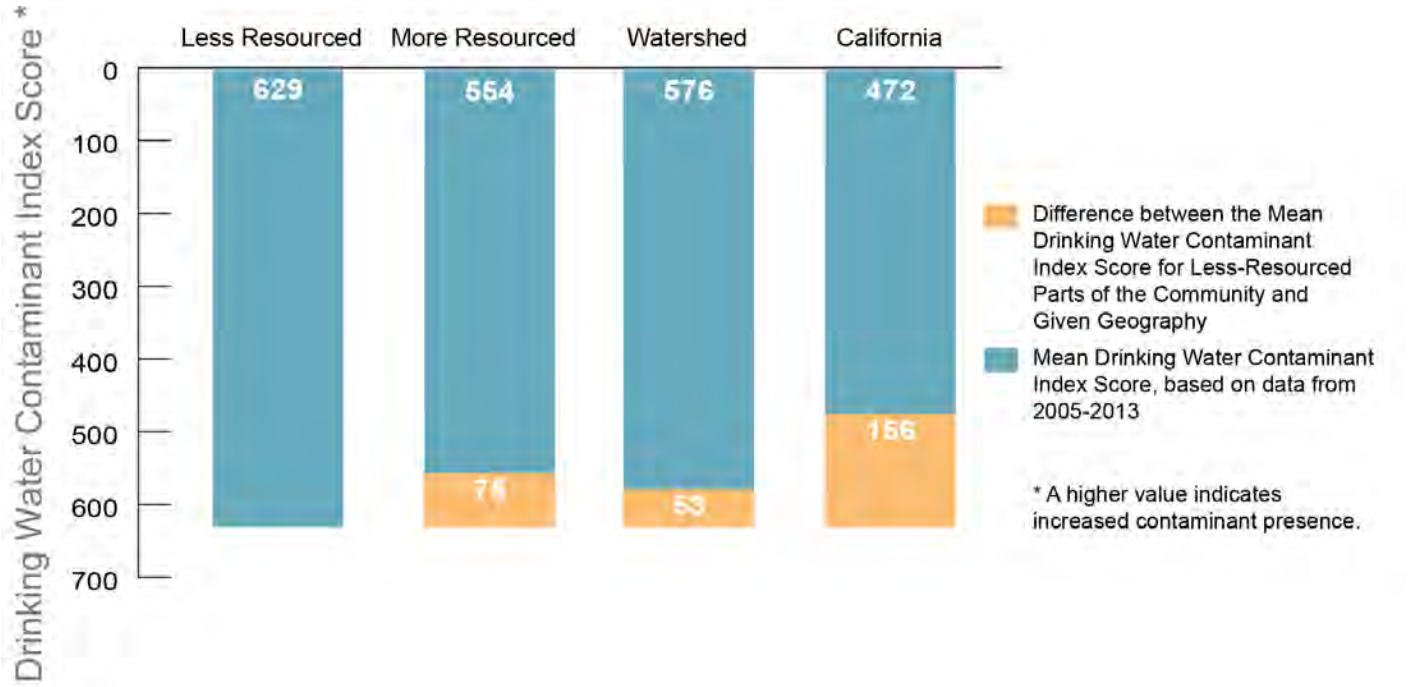
SAWPA

Indicator:	Metric:
Equitable access to clean drinking water	Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community

- Drinking water quality in less-resourced areas is somewhat worse than drinking water quality in more-resourced areas (mean drinking water quality index scores of 629 and 554, respectively), as calculated in 2017 based on 2005-2013 data. The indicator was given a qualitative neutral rating due to lack of previous data.
- No quantitative trend was assessed due to lack of previous data.
- Both the less-resourced and more-resourced parts of the community have lower drinking water quality than the statewide average (California mean drinking water quality index score is 472).

Why Evaluate this Indicator?

Ensuring that all people in the watershed have clean drinking water is essential to human health and prosperity within the watershed.



GOAL:

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed

SAWPA

Indicator:

Proportionate implementation of climate change adaptation strategies

Metric:

Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community

- The mean tree and shrub density of less-resourced residential parts of the community (9.9%) is slightly less than the tree and shrub density for the watershed as a whole and in more-resourced residential parts of the community (10.1% and 10.2%, respectively). The indicator was given a qualitative neutral rating due to lack of previous data.
- No quantitative trend was assessed due to lack of previous data.
- The mean tree and shrub density of less-resourced and more-resourced parts of the community is less than the Green View Index value for the City of Los Angeles (15.2%).

Why Evaluate this Indicator?

Targeted implementation of climate change adaptation strategies that address the potential for increased dangerous heat, a climate change impact predicted in the watershed, will reduce the extent to which vulnerable people are inequitably impacted.

GOAL:

Educate and build trust between people and organizations

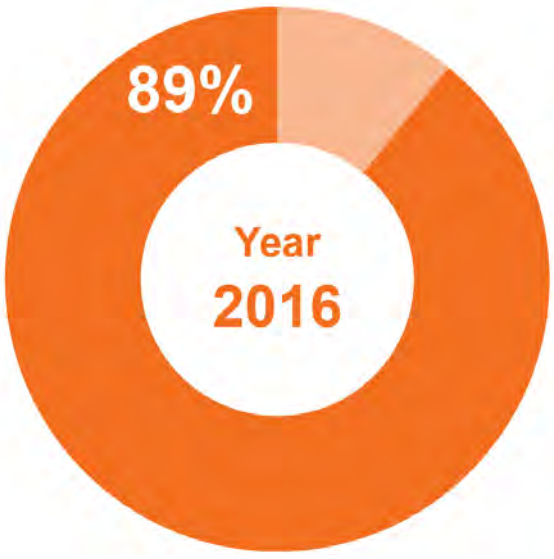
SAWPA

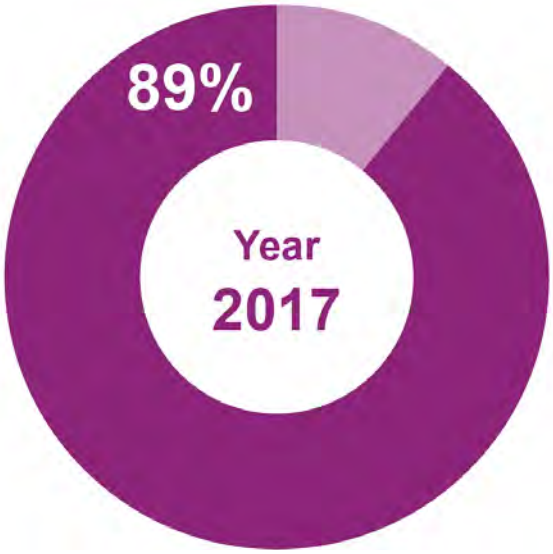
Indicator:	Metric:
Collaboration for more effective outcomes	Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation

- In 2017, 89% of regulated entities participated in TMDL implementation in the watershed (based on financial or in-kind contributions), the same percentage of regulated entities participated in 2016. Based on this significant continued participation, a positive rating was given.
- Nearly all of the TMDL implementation plans are being conducted in part through a collaborative entity, such as a SAWPA Task Force or the Newport Bay Watershed Executive Committee.
- Participation has remained at about the same level since 2014 , when the last OWOW Plan was adopted.

Why Evaluate this Indicator?

Collaborative action with shared outcomes must be prioritized by water managers because many of the complex challenges facing the watershed cannot be overcome by a single organization.





GOAL:

Educate and build trust between people and organizations

SAWPA

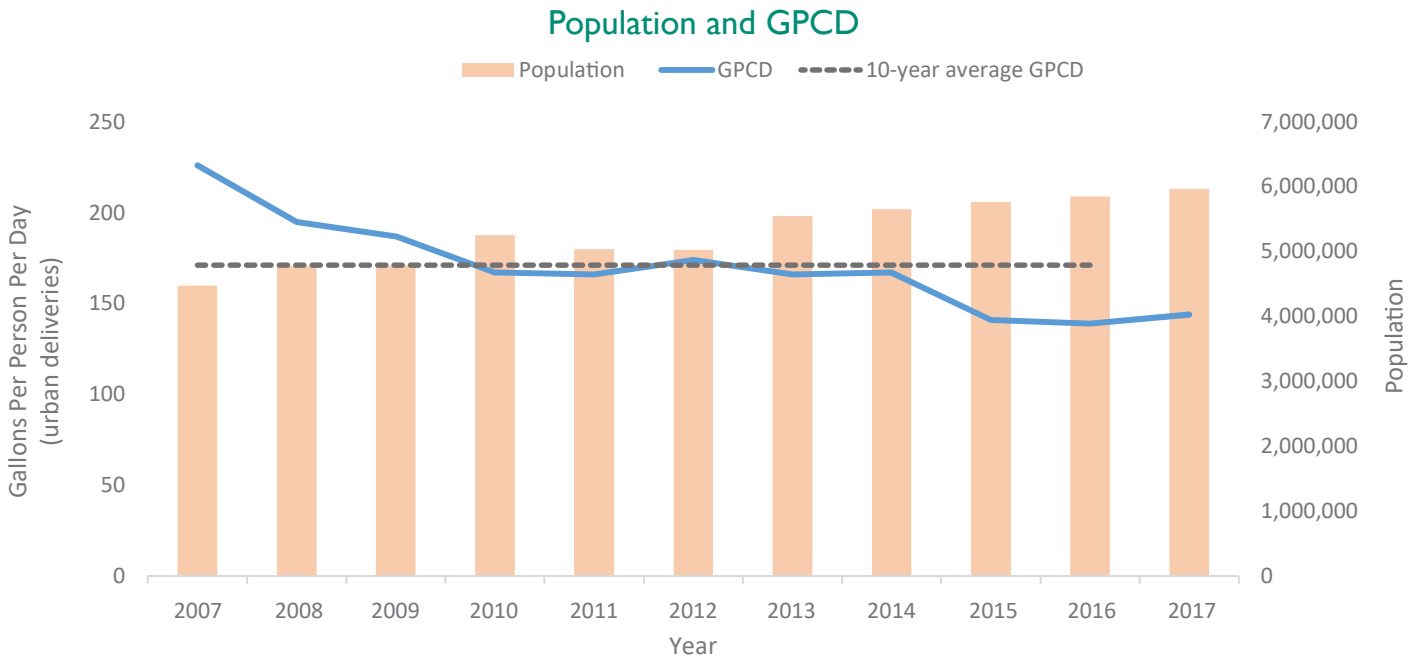
Indicator:
Adoption of a watershed ethic

Metric:
Total gallons of potable water used per capita per day

- Compared with the previous 10-year average, total gallons of water delivered per capita per day in the watershed in 2017 declined by 16%. Based on this more efficient water use, a positive rating was given.
- Between 2016 and 2017, the rate of water use per capita increased by about 3%.
- Since 2013, when the OWOW 2.0 Plan was drafted, the rate of water use per capita has declined by 13%.

Why Evaluate this Indicator?

Helping conservation become a way of life in California involves education and civic action. As more water users learn how precious our water and watershed are, many of the challenges will be more easily overcome. Total GPCD was the metric selected for this indicator because the data is available and its value is moderately responsive to management actions.



GOAL:

Improve data integration, tracking and reporting to strengthen decision-making

SAWPA

Indicator:

Broaden access to data for decision-making

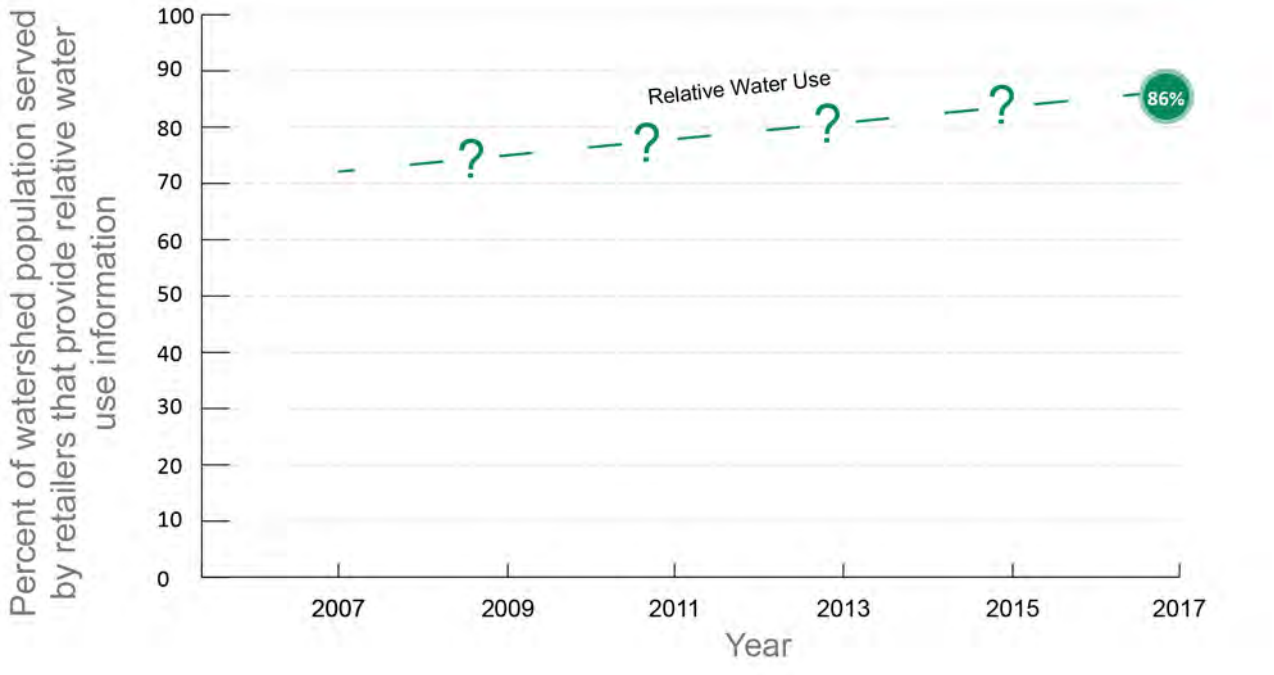
Metric:

Percent of watershed population in agencies whose residential customers receive relative performance information about their water use

- 86% of watershed's population are served by retailers that provide residential customers information on their bill about how their current water use compares to past water use and/or water use budgets or targets.
- Data about the relative water use information provided in previous years was not readily available from the retailers so only a qualitative trend assessment can be made.
- Since 2014 adoption of the OWOW Plan, increased adoption of budget-based rates as well as drought water use restrictions stimulated retailers to provide more relative water use information to residential customers. On this basis, a qualitative positive rating was given.

Why Evaluate this Indicator?

Everyone who uses water is a decision-maker. Informing people how they are using water relative to past and/or budgeted use, will improve decisions, increase efficiency, and make us more resilient.



GOAL:

Improve data integration, tracking and reporting to strengthen decision-making

SAWPA

Indicator:	Metric:
Participation in an open data process	Percent of watershed population in agencies participating in establishment of a regional data sharing system

- Sufficient quantitative data was not available to assess this metric, and qualitative information was not available to determine whether the rating should be positive or negative. The metric was therefore given a qualitative neutral rating. Assessment of this metric can start to occur when water management agencies in the SAWPA region commit to the establishment of a regional trust framework needed for data sharing and management.
- The majority of the watershed population are in wholesale and retail water supply agencies that have taken initial steps to establish regional data sharing by engaging with the implementation of the Open and Transparent Water Data Act (AB 1755) and/or participating in the California Data Collaborative.
- Progress since 2014 adoption of the OWOW Plan includes the 2016 passage of AB 1755 and the development of the recommendations in the Data Management Pillar in the OWOW 2018 update.

Why Evaluate this Indicator?

Our ability to create data is outstripping our ability to make effective use of it. Ensuring that data produced is meaningful, is applied to decision-making, and is shared freely without jeopardy is a critical next step for the management of the watershed's supply and demand.

Insufficient Data

ATTACHMENT A

Assessment Implementation Sheets

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Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Maximization of locally-managed supplies	*Percent of total annual supply sourced or managed locally*

Implementation Approach

This indicator and associated metric attempts to quantitatively assess progress on regional and local water management efforts to become more resilient, given the changing climate and the resulting increased variability in imported water supplies. These efforts include increasing recycled water use to replace and increase potable supplies, increasing recovered groundwater, increasing utilization and recharge of surface water runoff, optimizing local groundwater basin storage and utilization with coordinated operation and wetter year recharge of imported supplies, and demand reduction measures. The metric quantifies the locally-sourced supply for the retailers in the watershed plus the water recharged into groundwater basins, including water imported in wetter years used for groundwater recharge (i.e., imports not immediately used to meet retailer demand as this becomes a locally managed supply for later use), on an annual basis. The summed annual production and recharge is divided by the total annual production and recharge (including imported water to meet retailer demand) to calculate the percentage of total supply met from the locally-managed supply. The primary source for the retail supplier production is the State Water Resources Control Board's Large Water System Drinking Water Program Electronic Annual Report (SWRCB EAR). Groundwater recharge data can be obtained from wholesalers, special districts, flood control agencies, and watermasters of adjudicated groundwater basins.

Output

The metric output is the percentage of the watershed's total annual supply, including recharge, that is met by locally-sourced and -managed supply, including recharge as defined above.

Data Sources

The retailer supply data was limited to the 53 retail water suppliers that have over 3,000 water meters or that serve customers over 3,000 acre-feet of potable water (i.e., retailers required to prepare Urban Water Management Plans); these 53 retailers serve nearly 98% of the Santa Ana River watershed's population.[1] The primary data source for the retailer supply prior to 2013 is the Department of Water Resources (DWR) voluntary Public Water System Statistics (PWSS) Survey.[2] Starting in 2013, the PWSS data was extracted from the mandatory data reports filed by drinking water suppliers to the SWRCB Large Water System Drinking Water Program Electronic Annual Report (SWRCB EAR). The EAR form requires retailers to report their monthly and

[1] San Antonio Water Company (SAWCO) also files an Urban Water Management Plan. They wholesale water to qualifying retailers in the Inland Empire Utility Agency service area, but this agency was not included in the current retailer supply compilation. IEUA's annual water use report quantifies the sales and transfer of surface and groundwater to the IEUA retailers.

[2] The PWSS survey data is used for the regional water supply and demand balances in the California Water Plan. See https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Public-Water-Systems-Statistics-Surveys.

Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Maximization of locally-managed supplies	*Percent of total annual supply sourced or managed locally*

annual calendar year supply (disaggregated by the groundwater, surface water, untreated, recycled production, purchased water, and sales to other agencies) and metered water deliveries by customer class.

Detailed Implementation Steps

A detailed description of the implementation steps is not provided since the quantitative metric assessment could not be completed with current and historic data due to data deficiencies. Improvements in the systems used to capture data is expected to allow assessment of this metric in the future.

Once metric quantification is possible, trend assessment should compare current data to recent historic data by using the average value for the previous ten years to define recent historic conditions. This approach will help to distinguish variability in water supply due to annual water availability fluctuation from progress in increasing locally-sourced supply.

Implementation Challenges

The calculation of the metric is a percentage of total supply calculation once the data is compiled and accurately disaggregated by the source. Nonetheless, compiling accurate data can be quite challenging. In the 2007 to 2012 period, the PWSS survey did not have data for 6 to 7 of the 53 retailers.[3] The SWRCB EAR does not provide sufficient guidance for the retailers to report their supply sources in a consistent manner. Many of these discrepancies can be seen when comparing the data in the EAR reports with the data reported for a comparable year in their Urban Water Management Plans (UWMPs). Inconsistencies in the data reported to the EAR (described in more detail in the Implementation Challenges section below) stymied the assessment of this metric.

Observations about the EAR dataset made during the conduct of the current assessment include the following:

1. While most retailers report their imported water as purchased water, it appears that some of them report their purchased water as surface water production (reflecting perhaps that the source is from surface runoff to the Delta).[4]

2. Most retailers report groundwater from the desalters, which pump, treat, and sell saline groundwater, as purchased water, and thus it is lumped with the imported water.

3. Some, but not all, retailers report local surface supplies as purchased water while others report it as surface water.

4. At least one retailer that is also a wholesaler reported purchases and sales that appear to result in double-counting when compared to their retailer reports.

[3] The missing retailer data in the 2007-2012 period was not for the same set of 6 or 7 retailers in each year.

[4] The retailers in Orange County that purchase imported water directly from MWD reported their purchases as surface water. The reporting of each of the 53 retailers, however, was not examined in detail.

Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Maximization of locally-managed supplies	*Percent of total annual supply sourced or managed locally*

5. The EAR also has an "untreated" supply category which can be over 60 thousand acre-feet in some years, but it does not designate the source of that water.

6. The recycled production cannot be not disaggregated to determine whether it is sold to other users, or used for other purposes, such as to offset potable uses (e.g., landscaping), or used for habitat.

In addition, both the EAR and PWSS had quality control issues, with approximately 10 percent of the retailers having records requiring adjustment. In some cases, reported monthly totals and annual totals did not align. Some data values were clear outliers, potentially indicating inaccurate data entry. Units were also sometimes mismatched (for example, gallons entered into a column which should have been reported in acre-feet).

Results

Because the SWRCB Drinking Water annual report form had incomplete information for the retailers' supply reporting, resulting in numerous data inconsistencies, and procuring 2007 to 2017 data from the individual retailers was not feasible, no quantitative results are provided for this metric for either current or recent historic conditions.

Trend Discussion

While a more complete picture of locally-sourced or locally-managed supplies for the Santa Ana River watershed is not available, partial and regional data suggest that this metric may be increasing. Data from individual SAWPA wholesalers and for the larger MWD service area from the last 10 years indicate an increasing use of locally-managed supplies resulting from the investments in increased recycled water and groundwater recovery production in combination with demand reductions in this region.

For the current assessment, where data is lacking to show a trend, a qualitative neutral status is identified as the rating.

Going Forward

A cooperative effort by the watershed's water supply and management agencies, in concert with the State and local agencies to whom the data is reported, is needed to produce the quality data to quantitatively assess this metric. Currently there are opportunities and alignment of interests to rectify the data issues that inhibit the efficient quantification of this metric. DWR relies upon the retailer data reported to the SWRCB EAR for the regional water supply and demand assessments for the California Water Plan. DWR is aware of the data issues with the SWRCB EAR and the time-consuming effort to extract and confirm quality of the data for the California Water Plan and regional efforts, such as the OWOW Plan Update 2018. In addition, DWR is promoting and supporting regional data management efforts to develop indicators of sustainability, such as these OWOW indicators, as part of their implementation of the Open and Transparent Water Data

Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Maximization of locally-managed supplies	*Percent of total annual supply sourced or managed locally*

legislation (AB 1755).[5] DWR efforts align with OWOW plan goals to improve data integration, tracking and reporting as well as the Data Management Pillar's recommendations to establish data management and trust frameworks. Because of these alignments and opportunities, it is recommended that the watershed's water supply and management agencies engage with the State and regional agencies to whom the supply and demand data is reported to help produce quality data for this metric.

Assuming the retailer supply data reported SWRCB EAR can be accurately disaggregated by source, the data should be evaluated for consistency with comparable data reported in Urban Water Management Plans and wholesaler and watermaster annual reports. Individual wholesalers, such as Inland Empire Utility Agency (IEUA), compile annual reports with supply and demand data for their retailers, but it was not feasible in the allotted time for this assessment to determine if the wholesalers generally would be a source of retailer supply data. The groundwater recharge data sources—wholesalers, flood control agencies, special districts, and watermaster reports—were not examined for this effort once it became apparent that the data challenges would prevent metric analysis. Compilation of the groundwater recharge data will require careful evaluation for consistency with other regional reports reporting similar data.

References

Department of Water Resources (DWR), Public Water Systems Statistics Data from 2007 to 2016.

State Water Resources Control Board (SWRCB), Large Water System Drinking Water Program Electronic Annual Report, data for 2017.

5 As part of AB1755, DWR is also supporting efforts to automate some of the quality control review, such as mismatched units, which are not unusual and can be detected and corrected with software developed for those purposes.

Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Efficiency of outdoor water use	*Proportion of watershed population in agencies using parcel-level data to assess outdoor water use*

Implementation Approach

This indicator focuses on outdoor water use from landscape irrigation because it is estimated to be the largest source of demand in the SAWPA watershed. Parcel-level data can be obtained using tax assessor parcel databases and with aerial imagery. For this assessment, the metric evaluated participation in SAWPA's procurement and distribution of parcel-level vegetation data for the Santa Ana River watershed in the 2015-2017 period. The metric is currently limited to a one-time measurement of program participation by the water supply agencies.

Output

The output for this metric is expressed as the percentage of the total watershed population served by agencies that had license agreements with SAWPA to receive the parcel level imagery and vegetation data.

Data Sources

In 2015 SAWPA procured high-resolution aerial imagery of the watershed. That imagery in combination with high-accuracy land survey and parcel data was analyzed to produce accurate measurements of landscape vegetation for the 1.4 million urbanized parcels within the Santa Ana River watershed. This data was made available to retail and wholesale water suppliers and other water management agencies in the watershed. The data was distributed in 2016 and 2017 to the agencies which had a license agreement with SAWPA.

The population of the participating retail agencies was obtained from the population reported to the State Water Resources Control Board (SWRCB) Large Water System Drinking Water Program Electronic Annual Report. Wholesalers and SAWPA member agency population was obtained from the websites of the individual wholesalers and SAWPA.

Detailed Implementation Steps

This initial effort was a straightforward process of obtaining from SAWPA the list of wholesale and retail water suppliers who had license agreements to receive the imagery and landscaped vegetation measurements. The metric calculation involved summing the population of the participating agencies and dividing it by the watershed population. A separate calculation was made for the participating retail suppliers and for the wholesalers and SAWPA member agencies.

Implementation Challenges

This indicator and metric initially intended to survey all 53 qualifying retailers and the wholesalers in the watershed to assess whether they were using or had used any kind of parcel-

Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Efficiency of outdoor water use	*Proportion of watershed population in agencies using parcel-level data to assess outdoor water use*

level data to quantify landscape water use and measures to improve its efficiency. The qualifying retailers are those which had over 3,000 water meters or that served customers over 3,000 acre-feet of potable water (i.e., retailers required to prepare Urban Water Management Plans). That effort was not undertaken in this initial effort because of time constraints.

Results

TABLE A.2-1
PROCUREMENT OF SAWPA AERIAL IMAGERY AND PARCEL-LEVEL VEGETATION DATA

Entity Type	Number of Entities	Percent of watershed population served
Wholesale water suppliers, SAWPA member agencies	6	95%
Retail water suppliers	36	74%

By 2017, all five SAWPA member agencies (four wholesalers and the Orange County Water District) plus the Municipal Water District of Orange County (wholesaler), which together serve 95% of the watershed's population, requested the SAWPA-procured 2015 aerial imagery and data. The imagery and data was also requested by 36 retail water suppliers, which serve 74% of the watershed's population. Although this effort did not systematically survey all the water agencies on the use of the data, information provided by SAWPA indicated that 16 of the participating retailers (nearly half) used the data to assess parcels for rate structure investigations.[1]

Trend Discussion

This effort provided a one-time snapshot of the participation in the SAWPA program to procure and distribute parcel-level data. No quantitative information was obtained on participation in SAWPA's cooperative program to procure aerial imagery in previous years; therefore, only a qualitative trend assessment can be made. Previous OWOW plans identified the need to shift the focus of water efficiency programs from indoor to outdoor water use. SAWPA is a leader in leveraging resources and providing support for regional water use efficiency efforts. In a September 2018 report to the Southern California Water Committee, the California Data Collaborative cited SAWPA's cooperative purchasing program for aerial imagery as an example of overcoming technology barriers through collaboration (p.30)[2]:

> Beginning in 2007, SAWPA has procured aerial imagery on behalf of the Santa Ana watershed, allowing local jurisdictions to utilize the imagery and analysis for water-related research and planning. In order to determine the watershed's imagery needs, SAWPA collects information from jurisdictions to understand the imagery requirements with regard to resolution and use before putting together a series of specifications for vendors. SAWPA is

1 10 of the 16 agencies adopted or are in the process of adopting water budget-based rate structures.

2 California Data Collaborative 2018 California water efficiency: leading the way into the future: A report to the SCWC Water Energy Task Force September 10 2018.

Achieve resilient water resources through innovation and optimization	
INDICATOR	METRIC
Efficiency of outdoor water use	*Proportion of watershed population in agencies using parcel-level data to assess outdoor water use*

able to tell each participating agency the precise costs for a variety of imagery options, allowing them to make an informed decision based on their available budgets. SAWPA is then able to charge a small administrative fee of 2.5% to participating agencies, far lower than the savings enjoyed through the cooperative purchasing process alone.

Going Forward

This effort did not survey the water management agencies to determine how they used the imagery and whether other parcel-level data is used for managing outdoor water use and developing conservation rate structures. A more complete assessment of the watershed's use of parcel-level data, by surveying retailers and wholesalers in the watershed, is recommended.

Although this effort only resulted a one-time snapshot, it provides the potential to identify a trend, given SAWPA's decade-long history of aerial imagery procurement and continued development and expansion of their program. SAWPA is currently developing an online web application and cloud services to provide water retailers access to aerial imagery and landscape measurement data.

References

State Water Resources Control Board (SWRCB), Large Water System Drinking Water Program Electronic Annual Report, data for 2017.

California Data Collaborative, California water efficiency: leading the way into the future: A report to the SCWC Water Energy Task Force September 10 2018.

Ensure high quality water for all people and the environment.	
INDICATOR	METRIC
Maintenance of groundwater salinity at or below target levels	*Non-exceedance of groundwater salinity standards*

Implementation Approach

The salinity of groundwater is evaluated using the water quality modeling analysis conducted for the Triennial Basin Plan review for the Santa Ana Regional Water Quality Control Board (RWQCB). This analysis is used to establish the assimilative capacity for salt, or the ability to accept additional salt inputs without impairing water quality, for 37 different groundwater management zones within the Santa Ana River watershed. This is determined by the difference between estimated ambient water quality in terms of total dissolved solids, or TDS, and a water quality target established for each groundwater management zone. Ambient water quality shown for any given year is based on data for the 20 years prior to and including that year. The water quality target established for each groundwater management zone was set at the greater of the following: the water quality objective (WQO) established by the RWQCB, or 500 mg/l of total dissolved solids. Where established, the "maximum benefit" WQO was used as the WQO. The 500 mg/l criterion was adopted as the recommended maximum criterion for consumer acceptance established by the State. This criterion protects all municipal beneficial uses.

Conditions for each groundwater management zone were considered "good" if water quality objectives were substantially met and "bad" if they were not, for both recent and prior conditions. The evaluation was then made to determine whether the sequencing of prior to recent conditions warranted a positive, neutral, or negative trend result according to **Table A.3-1**.

TABLE A.3-1
GOOD-BAD ASSESSMENT SYSTEM

Prior Conditions	Recent Conditions	Result
GOOD	GOOD	+1
BAD	GOOD	+1
GOOD	BAD	-1
BAD	BAD	0 (if appreciably better)
BAD	BAD	-1 (if similar or worse)

The trend results were then weighted by the volume of groundwater estimated in storage in each groundwater management zone. Weighted results were then totaled to produce an overall score, which was rated using the criteria shown in **Table A.3-2**.

Ensure high quality water for all people and the environment.	
INDICATOR	METRIC
Maintenance of groundwater salinity at or below target levels	*Non-exceedance of groundwater salinity standards*

TABLE A.3-2
RATING SYSTEM

Result	Criterion
Positive	Score ≥ 0.50
Neutral	0.40 < Score < 0.50
Negative	Score ≤ 0.40

Output

The targeted output for each metric is a weighted average "good/bad"-based score for all current groundwater management zones under current conditions.

The "good/bad"-based scoring system is reflective of trends but configured to highlight conditions status relative to regulatory or generally-accepted water quality standards. If those standards are met, conditions are considered to be "good." This approach is considered more appropriate than suggesting that continued improvement beyond those standards was needed, as a simple trend analysis might imply.

Data Sources

The salinity of groundwater was evaluated using the analysis conducted for the Triennial Basin Plan review, specifically the Triennial Recomputation of Ambient Water Quality for the Santa Ana River Watershed for the Period 1996-2015 (DBS&A 2017), available at: https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/SMP/2017/AWQ-Tech-Memo_9-22-2017.pdf. Table 2-2 in this document provided estimated groundwater volumes used for weighting the results, while Table 3-1 in the document provided WQOs, assimilative capacity, and salinity over time, expressed as Total Dissolved Solids, or TDS.

In all cases, the "maximum benefit" water quality objectives were used for the basins that had them.

Detailed Implementation Steps

Analyses prepared to support the Triennial Review of the Basin Plan for salinity were reviewed to obtain the needed salinity data. TDS concentrations in each of the groundwater management zones for the most recent analysis (representing ambient conditions for the 20-year period ending in 2015) were evaluated to determine whether water quality targets were met. If so, a condition assessment of "good" was made for that basin. If not, the condition assessment was "bad."

A prior triennial estimate of ambient conditions was then assessed. Because each triennial assessment represents the ambient conditions of the preceding 20-year period, the 2015 analysis represents the period from 1996-2015. The triennial estimate ending halfway through the 20-year period of this most recent assessment (2006) was therefore selected for historical comparison, so that the two periods being compared have only 10 years of overlap. The TDS concentrations from the 2006 triennial assessment, covering the years 1987-2006, were compared to the water quality

Ensure high quality water for all people and the environment.	
INDICATOR	METRIC
Maintenance of groundwater salinity at or below target levels	*Non-exceedance of groundwater salinity standards*

targets; if that standard was met in a given zone, then recent historic conditions were assessed as "good." If not, they were assessed as "bad."

The most recent assessment results were then compared to those representing recent historic conditions to generate results per Table A.3-1. For the purposes of applying Table A.3-1, a score had to improve by more than 10 milligrams/liter to be considered "appreciably better." Those results were then weighted by groundwater volume and summed to provide the overall score for the metric. Weights for the results were established using groundwater volumes from Table 2-2 of the DBS&A report (2017).[1] The score was then evaluated using the criteria in Table A.3-2.

Implementation Challenges

The primary challenge associated with evaluating this metric is that data are only generated every three years, and then only for a period ending two years prior to the year in which values are published. Thus, annual updates may not be possible, and assessments may always rely on data from conditions two or more years prior to the current year.

An additional challenge is that some water quality estimates are missing. Because the basins that lacked enough data were assumed to be less important sources of water supply, basins missing an estimate of water quality under historic or current conditions were omitted from the analysis. Only 29 out of 37 groundwater management zones had enough data to produce findings.

Results

TABLE A.3-3
FINDINGS

Time Frame	Good Conditions	Bad Conditions
Current (1996-2015)	16 zones	13 zones
Recent Historic (1987-2006)	19 zones	10 zones

Using the findings above in **Table A.3-3** and the rubric established in Table A.3-1, results were generated for each groundwater management zone and modified by applying weights based on the groundwater volume in storage within each management zone. When these results were summed, a score of 0.53 was produced. This score yields a positive rating, based on the Rating System defined in Table A.3-2.

Trend Discussion

Because more than half (53 percent) of the groundwater volume in the groundwater management zones of the Santa Ana River watershed exists in four of the groundwater management zones, the

[1] An exception was made for the Orange County groundwater management zone, which was weighted using its active management volume of 500,000 acre-feet (OCWD, 2015) instead of the modeled aquifer volume of 23,600,000 acre-feet.

Ensure high quality water for all people and the environment.	
INDICATOR	METRIC
Maintenance of groundwater salinity at or below target levels	*Non-exceedance of groundwater salinity standards*

score for this metric will be primarily driven by what happens in these four groundwater management zones: Beaumont, Bunker Hill-B, Chino-North, and Irvine. In the current analysis, all but Irvine were found to warrant a positive rating, helping to keep the overall rating in the positive zone. The decline in the number of groundwater management zones in good condition from recent historic to current conditions, a drop from 19 to 16, may be due in significant part to the reduction in both natural recharge and use of imported water for groundwater recharge during the 2011-2016 drought.

Historical ambient water quality conditions in the groundwater management zones (based on 1954-1973 data) were typically better than current conditions.

Going Forward

The use of a 500,000 acre-foot management volume for the Orange County Groundwater Management zone should be revisited for appropriateness.

It may be possible to obtain information prior to the publication of the supporting analysis for the triennial review sufficient to perform analysis of this metric more often than once every three years—provided it is determined prudent to perform an assessment based on pre-publication data. The Triennial Review analysis of the 1999-2018 period may begin in late 2017 or early 2018 and may begin with the review of recent monitoring results that may be sufficient to allow 2016, 2017, or 2018 data to be assessed on an interim basis relative to historic assessment results, prior to the completion of modeling analysis. This opportunity can be evaluated.

The hypothesis that a 10-year period of non-overlap between 20-year periods of estimated ambient water quality is appropriate to use for a water quality trend analysis can also be revisited.

References

Daniel B. Stephens & Associates, Inc. [DBS&A]. 2017. Technical memorandum: Recomputation of ambient water quality in the Santa Ana River Watershed for the Period 1996 to 2015. Prepared for the Santa Ana Watershed Project Authority Basin Monitoring Program Task Force under contract.

Orange County Water District [OCWD]. 2015. Groundwater Management Plan 2015 Update, June 17.

Ensure high quality water for all people and the environment	
INDICATOR	METRIC
Safety of water for contact recreation	*Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination*

Implementation Approach

The safety of water for contact recreation was evaluated using routinely-collected monitoring datasets collected for inland and coastal water quality at sites used for recreation involving water contact. Conditions at each site were considered "good" if water quality objectives were substantially met and "bad" if they were not, for both recent and prior conditions. The evaluation was then made to determine whether the sequencing of prior to recent conditions warranted a positive, neutral, or negative trend finding according to **Table A.4-1**.

TABLE A.4-1
GOOD-BAD ASSESSMENT SYSTEM

Prior Conditions	Recent Conditions	Result
GOOD	GOOD	+1
BAD	GOOD	+1
GOOD	BAD	-1
BAD	BAD	0 (if appreciably better)
BAD	BAD	-1 (if similar or worse)

The "good/bad"-based scoring system is reflective of trends but configured to highlight conditions status relative to regulatory or generally-accepted water quality standards. If those standards are met, conditions are considered to be "good." This approach is considered more appropriate than suggesting that continued improvement beyond those standards was needed, as a simple trend analysis might imply. The good-bad assessment results were then averaged to produce an overall score (Score = Average of the findings), which was rated using the criteria in **Table A.4-2**.

TABLE A.4-2
RATING SYSTEM

Rating	Criterion
Positive	Score ≥ 0.80
Neutral	0.60 < Score < 0.80
Negative	Score ≤ 0.60

Separate scores are produced for inland and coastal water quality, separate ratings established, and then combined, using equal weighting for each. To combine the ratings for coastal and inland areas, the following system is applied:

Ensure high quality water for all people and the environment	
INDICATOR	METRIC
Safety of water for contact recreation	*Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination*

- Positive trend: One score shows a positive trend and the other score shows a positive or neutral trend.
- Neutral trend: Either both scores show a neutral trend or one is positive and one is negative.
- Negative trend: One score shows a negative trend and the other score shows either a negative or neutral trend.

Output

The targeted output for each metric is an average "good/bad"-based score for all current sites under current conditions.

Data Sources

Inland water quality monitoring data and compliance analysis was obtained from the Santa Ana River Watershed Bacteria Monitoring Program Annual Report (accessible from https://www.waterboards.ca.gov/santaana/water_issues/programs/planning/Bacteria_Monitoring_Program.html). Coastal water quality information is based on data and analysis used to generate the *Beach Report Card* (the 2017-2018 report is accessible at https://healthebay.org/wp-content/uploads/2018/07/BRC_2017-2018_07-12-18.pdf) and was obtained directly from Heal the Bay.

Inland water quality

The inland water quality monitoring data used for this metric was that associated with high-frequency use primary contact recreation sites, which are designated as Priority 1 sites and REC1 Tier A waters in the Santa Ana River Basin Plan.

> Eight monitoring sites, identified as REC1 Tier A waters, are included for Priority 1 monitoring. This includes four lakes: Big Bear Lake, Lake Perris, Canyon Lake, and Lake Elsinore; and four flowing water sites: SAR Reach 3 (two sites), Lytle Creek, and Mill Creek Reach 2. Five sites are located in Riverside County and two sites are located in San Bernardino County.
>
> …
>
> Dry weather sample collection occurs during both warm, dry (April 1 – October 31) and cool, wet (November 1 – March 31) season periods…. Priority 1… sites were monitored weekly for twenty consecutive weeks during the warm, dry season and for five consecutive weeks during the cool, wet season.
>
> …
>
> The compliance analysis compares the E. coli geomeans to the Santa Ana Basin Plan geomean WQO of 126 MPN/100 mL.
>
> (SAWPA, 2018)

Ensure high quality water for all people and the environment	
INDICATOR	METRIC
Safety of water for contact recreation	*Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination*

Notes:

1. SAR stands for Santa Ana River.
2. A geomean or geometric mean is the *n*th root of the product of *n* numbers.
3. WQO stands for Water Quality Objective.
4. MPN stands for Most Probable Number, or the count of organisms present. The acronym "mL" stands for milliliters, or a one thousandth of a liter.

Because there are so few sites, they are identified in **Table A.4-3** below.

TABLE A.4-3
INLAND WATER QUALITY SITES

Site ID	Name
P1-1	Canyon Lake at Holiday Harbor
P1-2	Lake Elsinore
P1-3	Lake Perris
P1-4	Big Bear Lake at Swim Beach
P1-5	Mill Creek Reach 2
P1-6	Lytle Creek (Middle Fork)
WW-S1	Santa Ana River Reach 3 at MWD Crossing
WW-S4	Santa Ana River Reach 3 at Pedley Avenue

More details on the methodology and basis for the site selection are available in the Annual Report.

Coastal water quality

Coastal water quality scores were based on more than 50 monitoring sites along the coast of the watershed compiled in the Beach Report Card. The Beach Report Card uses data compiled from "routine beach water quality sampling conducted by county health agencies, sanitation departments, and dischargers. Water samples are analyzed for three fecal indicator bacteria (FIB) that indicate pollution from numerous sources, including human and animal waste. These FIB are total coliform, fecal coliform (Escherichia coli), and Enterococcus spp." These data are analyzed for three different time periods over the April-March period:

- Summer dry season (April-October)
- Winter dry season (November – March)
- Year-round wet conditions (April – March)

Based on the monitoring data, a score of A+, A, B, C, D, or F is given to each site for each of the three seasons identified above. The assessment used only the dry season scores, as these are more indicative of conditions that affect most beachgoers.

Ensure high quality water for all people and the environment	
INDICATOR	METRIC
Safety of water for contact recreation	*Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination*

More details on the methodology and basis for the site selection are available in the annual Report Card.

The assessment approach used for both beach and inland sites relies on determining, for each site, whether improvements or degradation have occurred based on a comparison of current (as recent as available) versus prior period conditions. As a roll-up score, the average finding (for all positive, neutral, and negative findings) is used to generate a score. The beach and inland water quality findings are each assessed independently.

Detailed Implementation Steps

Inland water quality

The most recent Santa Ana River Watershed Bacteria Monitoring Program Annual Report was reviewed for its dry weather *E. coli* Priority 1 site results. "Good" scores were assigned to all sites with readings over the course of the year that produce a geomean exceedance frequency of 0% - 10%. A finding of "bad" was assigned to all other sites.

The most recent results were compared to those of the prior year to generate findings according to **Table A.4-1** and then those findings were averaged to produce a score. The score was then evaluated using the criteria in **Table A.4-2**. For the purposes of applying Table A.4-1, a score must improve by more than 10% to be considered "appreciably better."

Because dry weather flows are not expected to vary significantly due to year-to-year hydrologic variability, and because the current sites have only been evaluated and reported on in a consistent fashion for two years, prior year findings were used as a point of comparison instead of comparing to a multi-year average of prior year findings.

Coastal water quality

The most recent Beach Report Card evaluation was obtained for the relevant sites. Values are assigned as shown in **Table** A.4-**4**.

TABLE A.4-4
BEACH GRADES AND VALUATION

Grade	Numeric Range	Value
A, A+	100%-90%	4
B	89%-80%	3
C	79%-70%	2
D	69%-60%	1
F	<60%	0
–	–	0

Ensure high quality water for all people and the environment	
INDICATOR	METRIC
Safety of water for contact recreation	*Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination*

A grade of A or A+ receives an assessment of "good"; all other grades receive an assessment of "bad." The current assessment was then compared to the average value of dry season grades for the prior 3 years. For this multi-year average of two grades per year, any value of 7 or above was considered "good."

The most recent results were compared to those of the prior year to generate findings according to Table A.4-1 and then those findings were averaged to produce a score. The score was then evaluated using the criteria in Table A.4-2. For the purposes of applying Table A.4-1, a score had to improve by more than one point in value, equivalent to one letter grade, to be considered "appreciably better."

Implementation Challenges

1. For both inland and coastal water quality, data bridges the calendar year—each report runs from April through March—which is not fully consistent with the time periods assessed for other metrics.

2. For both data sets, changes in location and the approach to assessing data can be expected to occur from time to time. This was addressed by using only reasonably consistent datasets for comparison and was not seen to be a significant impediment in the current assessment.

3. A limited data set was available for each metric, as both sites and methodologies have evolved over time. For inland water quality, data was available for only the two most recent years. This was determined to be adequate, as dry season water quality is hypothesized to not be significantly affected by hydrologic variability. For coastal water quality, data was available for both summer and winter dry periods for only four years, allowing only a 3-year average as a point of comparison for trend analysis between current and recent historic conditions.

4. The coastal data set is missing some grades. These were assessed as having zero value, consistent with an "F" grade.

Results

TABLE A.4-5
ASSESSMENT RESULTS AND RATING

Metric	Score	Rating
Inland	0.63	Neutral
Coastal	0.81	Positive
Combined		**Positive**

Trend Discussion

Inland water quality

Six out of eight inland water quality sites showed "good" results for both the 2017-2018 and 2016-2017 assessment years, with both the Santa Ana River sites producing results that were

Ensure high quality water for all people and the environment	
INDICATOR	METRIC
Safety of water for contact recreation	*Percentage of monitored sites where recreational use is likely and identified as low risk due to bacterial contamination*

classified as "bad." However, one of the two sites exhibited significantly reduced (improved) exceedance values, dropping from 82% to 53%.

While a longer-term comparable dataset is not readily available, experts note that while measured bacteria concentrations have been increasing, the total load has not been, even as population has continued to grow. A significant driver in those concentration increases has been the increase in stormwater and recycled water diversions for groundwater recharge (Tim Moore, personal communication).

Coastal water quality

A total of 49 out of 58 or 85%of coastal water quality sites were identified as having "good" water quality in 2017-2018, compared to 41-49 or 71 – 85% of sites in the preceding three years (2014-2017). Only two sites identified as having "bad" water quality in 2017-2018 had failed to improve appreciably, compared to average conditions over the prior three years.

Going Forward

Inland water quality results should be scrutinized in future years to assess whether the hypothesis that dry season water quality is not significantly affected by hydrologic variability is supported.

Coastal water quality trend findings should be based on a longer multi-year average than three years, as they are hypothesized to be significantly affected by hydrologic variability. The multi-year basis for comparison should be extended to 5 years or more, as data becomes available.

References

Heal the Bay, 2018. 2017-2018 Beach Report Card.

SAWPA (Santa Ana Watershed Project Authority), 2017. Santa Ana River Watershed Bacteria Monitoring Program Annual Report: 2016-2017 FINAL REPORT.

SAWPA (Santa Ana Watershed Project Authority), 2018. Santa Ana River Watershed Bacteria Monitoring Program Annual Report: 2017-2018 FINAL REPORT.

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of vegetated riparian corridor	*Area of vegetated riparian corridor*

Implementation Approach

The abundance of vegetated riparian corridor was evaluated using an analysis approach developed by the US Forest Service in conjunction with the School of Forest Resources & Environmental Science at Michigan Technological University. Software developed to implement this process uses readily-available streams, topography, and hydrologic data to identify an estimated riparian corridor area for a given stream network, and then uses an annually-generated national land cover dataset to calculate the areas of different land cover types within the riparian corridor. Within the defined riparian corridor, lands with forest, shrubland, wetlands, and open water are defined as vegetated riparian area. Areas with land cover defined as crops, developed, or barren are excluded. This process is executed within the SAWPA boundary to determine the vegetated riparian area within the Santa Ana River watershed.

Trends for vegetated riparian area are evaluated by comparing the most recent results for vegetated riparian area to the average for the five previous years. This multi-year averaging approach was taken to reduce the influence of hydrologic variability on baseline land cover conditions. The trend is used to identify the rating. Thresholds used to identify the trend are shown in **Table A.5-1** below.

TABLE A.5-1

TREND RATING SYSTEM

Rating	Criterion
Positive	Result ≥ 1,000 acres
Neutral	-1000 acres < Result < 1,000 acres
Negative	Result ≤ -1,000 acres

Output

The output of the analysis process is the area of vegetated riparian corridor.

Data Sources

The analysis process uses stream gage data to estimate 50-year flood levels for a range of stream sizes, or orders, based on a stream's relationship to its headwaters and incoming tributaries. Additionally, it uses multiple nationally-generated datasets, as shown in **Table A.5-2**. The land cover dataset is generated annually to provide estimates of crop acreages of major commodities using satellite imagery at a 30-meter resolution.

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of vegetated riparian corridor	*Area of vegetated riparian corridor*

TABLE A.5-2
DATA SOURCES

Data Type	Source Name	URL
Stream gage data	USGS stream gaging network	*https://maps.waterdata.usgs.gov/mapper/index.html*
Stream network	USGS National Hydrography Dataset	*http://nhd.usgs.gov*
Topographic data	The National Map	*http://nhd.usgs.gov/*
Land cover data	CropScape	*https://nassgeodata.gmu.edu/CropScape/*

Detailed Implementation Steps

Directions for data preparation are available at: https://docs.wixstatic.com/ugd/d5da6c_dd8e6178b3114dac9e2a5e3c1f99abe4.pdf.[1] A toolbox for implementation is available at www.riparian.solutions.

Implementation notes:

- Use no spaces or special characters in watershed feature class names; make sure field types (double, long integer) are correct.
- Make sure all input data share the same projected coordinate system using meter linear units. When reprojecting rasters, it is important to maintain the same pixel/cell size for projected rasters.
- Create separate file geodatabases to store vector data and raster data (e.g., project_vector.gdb and project_raster.gdb). If everything is stored in a single geodatabase file, Arcmap may delete all rasters during script processing to free up resources.
- The toolbox includes a utility to check the input files to ensure projections and field names/types are correct for processing.
- Determine 50-year flood heights for stream order/levels within study area using this guide - https://docs.wixstatic.com/ugd/d5da6c_5e1ba4a770804211834b1e6a513ed960.pdf.

For the current analysis, data from 17 gages were used and the 50-year flood estimates from the worksheets for each stream order were averaged to generate the model 50-year curve. Three estimates were excluded as outliers that seemed to be drastically affecting the model fit. The more plausible polynomial (2nd order) model fit was used to generate the "FloodData" required—that is, a modeled 50-yr flood height for each stream order in the data set. The "FloodData" and related riparian buffers generated for the current analysis need not be regenerated until at least 10

[1] For this analysis, the standard approach was applied without accounting for soil types, which were not expected to be helpful for defining riparian corridors in this region.

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of vegetated riparian corridor	*Area of vegetated riparian corridor*

years of additional gage data are available, additional gages with at least 10 or more years of data become available, or additional stream vectors are added.

The watershed area, at about 2.6 million acres, includes more than 100 subwatersheds at the "HUC-12" level. The tool loops through each subwatershed in turn, first generating a buffer around the stream vectors, creating a buffer feature class within a new geodatabase for each subwatershed. A script was used to combine all the subwatershed geodatabases into a single file. This produced the riparian corridor extents dataset. The land cover datasets from CropScape were then overlain to extract the land cover areas within the riparian corridors. Within the defined riparian corridor, lands with forest, shrubland, wetlands, and open water were defined as vegetated riparian area. Areas with land cover defined as crops, developed, or barren were excluded. Total vegetated riparian areas within the riparian corridor extents were calculated.

TABLE A.5-3
LAND COVER DATASETS USED

Time Frame	CropScape
Current	2017
Recent Historic	2012-2016

Implementation Challenges

Riparian corridors are approximately defined, though in a way that provides consistency in approach. Similarly, the land cover data is being generated for a different purpose than tracking the abundance of riparian vegetation and no doubt imperfectly characterizes these land cover conditions, but at least is generated in a relatively consistent fashion. From time to time, changes in methodology or satellite imagery characteristics used to generate the land cover dataset may trigger changes in results from one year to the next that are not driven by changes on the ground.

Results

TABLE A.5-4
ANALYSIS RESULTS (ACRES)

Time Frame	Riparian Vegetation	Other
Current (2017)	21,727	27,060
Recent Historic (2012-2016)	20,518	28,268

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of vegetated riparian corridor	*Area of vegetated riparian corridor*

Trend Analysis

The data shown in **Table A.5-4** above was analyzed to determine the change in acres from the calculated recent historic average to current conditions. The result is presented in **Table A.5-5** below.

TABLE A.5-5
TREND ANALYSIS RESULTS

Time Frame	Change (acres)
Recent Historic (2012-2016) to Current (2017)	1,209

Because the average annual change from recent historic to current conditions exceeds 1,000 acres, the trend analysis and therefore the rating for this metric is positive.

Going Forward

No recommendations.

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of conserved open space	*Area of conserved open space*

Implementation Approach

Multiple data sources are used to identify the area of conserved open space. Conserved open space is defined as including lands owned in fee title for open space purposes, conservation easements, and agricultural lands that are restricted from development under the Williamson Act. Conservation easements are deed-based restrictions on private land that limit its uses to those compatible with maintaining it as open space. Williamson Act restrictions provide landowners with a tax break when they enroll their agricultural or open space lands in the program, which requires that the lands be kept in agriculture or open space for a rolling 10-year period.

GIS datasets representing these land areas are developed by others and are readily available. These datasets are intersected with the SAWPA boundary to identify the total area of land within these categories within the watershed. Comparison of the most recent data to recent historical data is used to identify the trend for this metric, and the trend is used to identify the rating. Thresholds used to identify the trend are shown in **Table A.6-1** below.

TABLE A.6-1
RATING SYSTEM

Rating	Criterion
Positive	Result ≥ 1,000 acres
Neutral	-1,000 acres < Result < 1,000 acres
Negative	Result ≤ -1,000 acres

Output

This analysis generates an estimate of the area of conserved open space within the Santa Ana River watershed, including lands owned in fee title for open space purposes, conservation easements and agricultural lands restricted from development.

Data Sources

Lands identified in the California Protected Areas Database (CPAD), California Conservation Easement Database (CCED), and Williamson Act lands are used to represent the total area of conserved open space. Both CPAD and CCED are maintained by the California-based nonprofit organization GreenInfo Network. Williamson Act lands are tracked by county tax assessors' offices.

Lands identified in CPAD are compiled from data provided by approximately 1,100 public agencies or nonprofit organizations. It is known to be incomplete and is subject to continual updating. Until recently, data entry did not include the time of acquisition of the land. The most

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of conserved open space	*Area of conserved open space*

recent dataset available is from August 2017. Prior datasets have been released one to two times per year, dating back to the first release in May, 2008.

Lands identified in CCED were compiled from multiple sources (approximately 215 public agencies or nonprofit organizations). It is known to be incomplete and is subject to continual updating. Until recently, data entry did not include the time of acquisition of the easements. The first version of the dataset was released in April 2014. It was used to represent recent historic conditions. The second and most recent dataset was released in December 2016.

Because Williamson Act datasets are associated with tax assessment, these datasets are expected to be both current and complete.

Detailed Implementation Steps

Recent and historic CPAD and CCED datasets were downloaded from http://www.calands.org/data.

Williamson Act datasets were obtained from the three primary counties in the Santa Ana River Watershed: Orange, Riverside, and San Bernardino. (Data for Los Angeles County, which contains a very small part of the watershed, was not included.) No data was available for 2016 Orange County Williamson Act lands; these were counted as zero.

TABLE A.6-2
RELEASE DATASETS USED

Time Frame	CPAD	CCED	Williamson Act
Current	August 2017	December 2016	2016
Recent Historic*	March 2014	April 2014	2014
Older Historic	July 2012	Not Available	2012

* The analysis used 2014 to represent recent historic conditions, as that was the most recent prior data for the CCED dataset.

Datasets were overlain with the SAWPA boundary and any overlapping areas of the datasets within that were clipped to avoid double-counting. Total acreages were identified for "current" and "recent historic" time periods. A difference in the total land area classified as conserved open space in current conditions compared to recent historic conditions was identified as the score. The result was evaluated according to the criteria shown in Table A.6-1 to determine the rating.

Implementation Challenges

1. Data incompleteness – Both the CPAD and CCED datasets are known to be incomplete. The addition of missing data causes the apparent area of conserved open space to grow when no changes in land protection have occurred. Efforts are underway to address this issue by adding acquisition dates to the dataset, but enhancing the dataset will take time and relies in significant part on voluntary actions. It would be possible in the future for actors within the Santa Ana River watershed boundary to make a concerted investment in improving both

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of conserved open space	*Area of conserved open space*

CPAD and CCED within the watershed to improve the quality of the data used to evaluate this metric.

2. Irregular release dates – Both CPAD and CCED are released periodically but irregularly. As a result, "current" conditions may not be very current, and datasets added together mix different snapshots in time.

Results

TABLE A.6-3

ANALYSIS RESULTS

Time Frame	CPAD (square miles)	CCED (square miles)	Williamson Act (square miles)	Total (square miles)	Total (acres)
Current (2016-2017)	905	24	407	1,337	855,501
Recent Historic (2014)	880	18	433	1,331	851,868
Older Historic (2012)	887	NA	440	1,327	849,010

Trend Analysis

The data shown in **Table A.6-3** above was analyzed to determine the average annual change in acres. Because the most current dataset covers a 2-year span, an assumption of 2.5 years for the time period from recent historic to current conditions was made. The results are presented in **Table A.6-4** below.

TABLE A.6-4

TREND ANALYSIS RESULTS

Time Frame	Years Assumed for Averaging	Average Annual Change (acres)
Recent Historic (2014) to Current (2016-2017)	2.5	1,453
Older Historic (2012) to Recent Historic (2014)	2	1,429

Because the average annual change from recent historic to current conditions exceeds 1,000 acres, the trend analysis and therefore the rating for this metric is positive.

Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function	
INDICATOR	METRIC
Abundance of conserved open space	*Area of conserved open space*

Going Forward

As noted above under implementation challenges, there is an opportunity for players within the Santa Ana River watershed to improve the quality of the data on which this metric relies. The CPAD and CCED datasets both accept input to improve datasets. In particular, adding information on when acquisitions were made would greatly improve the utility of this dataset for assessment purposes.

References

GreenInfo Network, California Protected Areas Database (CPAD) and California Conservation Easement Database (CCED). http://www.calands.org/data.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Equitable access to clean drinking water	*Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community*

Implementation Approach

To assess this indicator and metric, one existing dataset compiled by the state Office of Environmental Health and Hazard Assessment (OEHHA) was overlaid with a dataset compiled by the state Department of Water Resources (DWR) in a geographic information system (GIS). Both datasets were available by census tract. The purpose was to understand the extent to which drinking water contamination is an environmental justice issue in the watershed and whether that issue is increasing or decreasing over time.

The rating system used for this indicator and metric is reflective of trends but configured to primarily highlight the change in water quality in less-resourced parts of the community. An improvement in water quality in the less-resourced parts of the community (LR), along with no decline in water quality in more-resourced parts of the community (MR), was considered a positive trend. Other combinations of the change in index value for less-resourced and more-resourced parts of the community were considered either neutral or negative trends. Unless drinking water quality in less-resourced parts of the community improves, the rating cannot be a positive trend. In summary,

- Positive trend: LR result shows an improving trend and MR result shows an improving trend or neutral trend.
- Neutral trend: LR and MR results both show a neutral trend.
- Negative trend: At least one result shows a worsening trend.

The rating system shown in **Table A.7-1** identifies the rating given to changes in the LR or MR result. For example, in order to show an improving trend, the LR result would need to improve by over 10% between current and historic conditions. Anything less than 10% change in the LR result would show a neutral trend for the LR.

TABLE A.7-1
TREND RATING SYSTEM

Rating	Criterion
Positive	Result ≥ 10% decrease
Neutral	-10% < Result < 10%
Negative	Result ≥ 10% increase

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Equitable access to clean drinking water	*Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community*

Output

The output for this metric consists of a combination of the trend in mean drinking water quality index scores of the less-resourced parts of the community and the more-resourced parts of the community.

Data Sources

California Water Code Section 79505.5(a) defines a "disadvantaged community" as a community with annual median household income that is less than 80 percent of the statewide annual median household income. The Department of Water Resources (DWR) uses data from the U.S. Census Bureau American Community Survey to characterize areas (census tracts) throughout California where people would be considered as members of "disadvantaged communities" in accordance with the Water Code definition. Areas where people who would be considered members of disadvantaged communities as identified in the DWR data were considered less-resourced parts of the watershed community for purposes of this analysis. All other census tracts within the watershed were considered more-resourced parts of the community.

Data from CalEnviroScreen version 3.0, based on 2005-2013 data and completed in 2017, was used in this assessment.[1] The temporal range of data used represented three compliance periods, and was selected due to the fact that some water supply systems only test once during a cycle. The next version of CalEnviroScreen is planned for release in 2019; with that version the indicator will be based on data from 2008 through the current compliance period. The indicator score is calculated using average contaminant concentrations over the three compliance periods.

The drinking water contaminant index combines information about 13 contaminants and 2 types of water quality violations that are sometimes found when drinking water samples are tested.[2] The index values across California range from less than 165 to over 812. A higher value indicates increased contaminant presence. The following five steps were used in CalEnviroScreen to calculate the index.

1. Establish drinking water system boundaries.
2. Associate water contaminant data with each drinking water system, and calculate average contaminant concentrations.
3. Reallocate each drinking water systems' average water contaminant concentrations to census tracts.

[1] CalEnviroScreen 3.0 geodatabase can be downloaded from https://oehha.ca.gov/calenviroscreen/maps-data/download-data.

[2] The contaminants are arsenic, cadmium, hexavalent chromium, dibromochloropropane (DBCP), lead, nitrate (NO3), perchlorate, radium 226 and 228, total trihalomethanes (THM), tetrachloroethylene (PCE), trichloroethylene (TCE), 1,2,3-trichloropropane, and uranium. The two violation types evaluated were maximum contaminant level (MCL) violations and total coliform rule violations.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Equitable access to clean drinking water	*Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community*

4. Rank census tracts to obtain percentile score for each contaminant and tract.
5. Calculate census tract contaminant index, which is the sum of the percentiles for all contaminants.

Contaminant data from the following sources were used to calculate the index:

- CDPH drinking water systems geographic reporting tool
- CDPH Public water system location data in the PICME database
- US EPA Safe Drinking Water Information System
- CDPH Water Quality Monitoring Database
- SWRCB GAMA Domestic Well Project
- SWRCB and USGS GAMA Priority Basin Project

Detailed Implementation Steps

The most recent drinking water contaminant and disadvantaged community data was downloaded from the CalEnviroScreen website. Using GIS, census tracts within the SAWPA boundary were identified and evaluated. All areas within disadvantaged communities were identified as less-resourced, and areas outside of disadvantaged communities were identified as more-resourced. The average index value was identified for both less- and more-resourced areas.

Data for recent historic conditions was not evaluated during the current assessment, as comparable data did not exist.

Implementation Challenges

CalEnviroScreen 3.0 used the same compliance data as CalEnviroScreen 2.0 (data collected over the three compliance periods during 2005-2013), and CalEnviroScreen 1.0 used a different metric to evaluate water quality (the indicator was "impaired water bodies," and the metric was summed number of pollutants across all water bodies designated as impaired within each zip code). In CalEnviroScreen 1.0, a score was assigned to each zip code instead of each census tract, each zip code was scored based on the sum of the number of individual pollutants found within and/or bordering it, and the score was based on surface water quality, not necessarily on drinking water. For this reason, a trend analysis for this indicator was not completed with this implementation of the assessment.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Equitable access to clean drinking water	*Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community*

Results

TABLE A.7-2
WATER CONTAMINANT INDEX RESULTS

Estimated Population	Mean Water Contaminant Index Score	Total Tracts	Total Area (square miles)	Percent (Number) of Tracts Above the Mean Watershed Index Score
Less-Resourced Parts of the Community				
1,716,533	628.53	335	717.4	56.6 (188)
More-Resourced Parts of the Community				
4,341,250	554.13	799	2,122.4	42.0 (335)
Watershed				
6,057,783	575.97	1,131	2,839.9	N/A

SOURCE: CalEnviroScreen Version 3.0

Recent historic data was not available, since the CalEnviroScreen 3.0-type analysis was only completed for one period. For this reason, the assessment is qualitative, and the rating is neutral.

Trend Analysis

The mean contaminant index score for less-resourced parts of the community is higher than the mean score for more-resourced parts of the community, indicating a higher degree of contamination, and the difference in scores is statistically significant, as discussed below. In addition, more-resourced parts of the community include fewer tracts above the mean watershed index score than are present in less-resourced parts of the community. The mean index score for more-resourced parts of the community is below the mean index score for the entire watershed.

Statistical analysis conducted with an independent two-sample t-test on equal samples of less-resourced tracts (n= 332) and more-resourced tracts (n= 332) documents a statistically significant difference in water quality values between the two groups: $t(661) = 3.49$, $p = 0.001$. Less-resourced tracts exhibited higher values (mean = 628.5; median = 686.7) than more-resourced tracts (mean = 563.1; median = 515.8), although the effect size is moderately small (Cohen's $d = 0.27$) (Gail and Sullivan, 2012).

Going Forward

While a trend was not evaluated with this implementation of the assessment, as noted previously, OEHHA plans to release CalEnviroScreen 4.0 in 2019, which would be updated to use compliance data from the 2008-current period.

Mean values were used in this assessment to determine statistical significance; however, the use of median values may be more appropriate and should be evaluated for use in future assessments.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Equitable access to clean drinking water	*Relative value of the drinking water contaminant index from CalEnviroScreen between less resourced parts of the community and more resourced parts of the community*

References

Gail M. Sullivan, Richard Feinn, (2012) Using Effect Size—or Why the P Value Is Not Enough. Journal of Graduate Medical Education: September 2012, Vol. 4, No. 3, pp. 279-282.

California OEHHA, CalEnviroScreen 3.0 geodatabase can be downloaded from https://oehha.ca.gov/calenviroscreen/maps-data/download-data.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Proportionate implementation of climate change adaptation strategies	*Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community*

Implementation Approach

The relative value of tree and shrub density between different parts of the community was evaluated using tree and shrub density data available at the parcel level from Santa Ana Watershed Project Authority (SAWPA) and Department of Water Resources (DWR) data available by census tract. These data were overlaid in a geographic information system (GIS). To the extent that residential parcels in less-resourced parts of the community have lower tree and shrub density, this indicator measures the equitable implementation of vegetation planting as a climate change adaptation strategy.

The rating system used for this indicator and metric is reflective of trends but configured to primarily highlight the change in water quality in less-resourced parts of the community. An improvement in water quality in the less-resourced parts of the community (LR), along with no decline in water quality in more-resourced parts of the community (MR), was considered a positive trend. Other combinations of the change in index value for less-resourced and more-resourced parts of the community were considered either neutral or negative trends. Unless drinking water quality in less-resourced parts of the community improves, the rating cannot be a positive trend. In summary,

- Positive trend: LR result shows an improving trend and MR result shows an improving trend or neutral trend.
- Neutral trend: LR and MR results both show a neutral trend.
- Negative trend: At least one result shows a worsening trend.

The rating system shown in **Table A.8-1** identifies the rating given to changes in the LR or MR result. For example, in order to show an improving trend, the LR result would need to improve by over 10% between current and historic conditions. Anything less than 10% change in the LR result would show a neutral trend for the LR.

TABLE A.8-1
TREND RATING SYSTEM

Rating	Criterion
Positive	Result ≥ 10% decrease
Neutral	-10% < Result < 10%
Negative	Result ≥ 10% increase

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Proportionate implementation of climate change adaptation strategies	*Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community*

Output

The targeted output for this metric consists of a combination of the trend in median tree and shrub density in the less-resourced parts of the community and the more-resourced parts of the community.

Data Sources

SAWPA generated the tree and shrub data used for this indicator based on aerial imagery collected in 2015. The tree and shrub data covers areas cumulatively containing approximately 99% of the watershed population. The tree and shrub data for residential parcels was overlaid with the less-resourced tracts and more-resourced tracts in the watershed (identified using the DWR data) to see if the changes in density are occurring more frequently in either tract type.

California Water Code Section 79505.5(a) defines a "disadvantaged community" as a community with annual median household income that is less than 80 percent of the statewide annual median household income. The Department of Water Resources (DWR) uses data from the U.S. Census Bureau American Community Survey to characterize areas (census tracts) throughout California where people would be considered as members of "disadvantaged communities" in accordance with the Water Code definition. Areas where people who would be considered members of disadvantaged communities as identified in the DWR data were considered less-resourced parts of the watershed community for purposes of this analysis. All other census tracts within the watershed were considered more-resourced parts of the community.

Detailed Implementation Steps

Tree and shrub data was collected for residential parcels within the SAWPA boundary, and the DWR disadvantaged communities dataset was downloaded from the DWR Disadvantaged Communities Mapping Tool. The tree and shrub data were overlaid with DWR disadvantaged communities data in GIS, and tree and shrub density was calculated by dividing the tree and shrub area by the total area of less-resourced parts of the community (the total area of disadvantaged communities mapped in the watershed).

> Tree and shrub density (as a percentage) = total tree and shrub area in disadvantaged communities, square miles / total disadvantaged communities area, square miles

The same calculation was completed for more-resourced parts of the community (all areas in the watershed that are not mapped as part of the DWR disadvantaged communities), and the relative values of tree and shrub density for the less-resourced and more-resourced areas was calculated. The statistical significance of this difference was evaluated; if the difference was not statistically significant, the metric value is zero and the rating is neutral.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Proportionate implementation of climate change adaptation strategies	*Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community*

Data for recent historic conditions was not evaluated during the current assessment, as comparable data did not exist.

Implementation Challenges

The tree and shrub data used for this analysis was generated by imagery analysis of aerial photos from 2015. This is the most recent data available. Analysis of earlier or more recent aerial imagery has not occurred. However, given the utility of the data, SAWPA anticipates collection and genesis of this type of data will continue in the future. In the future, SAWPA would then be able to assess the trend within the Santa Ana region.

Results

TABLE A.8-2
TREE AND SHRUB DENSITY RESULTS

	Less-Resourced Areas	More-Resourced Areas
Number of parcels, residential	347,238	1,070,308
Number of census tracts, residential	319	749
Total Area, residential (square miles)	627	1,718
Total Tree and Shrub Area, residential (square miles)	62	175
Tree and Shrub Density (percent)	9.89	10.19

SOURCE: SAWPA

Table A.8-2 presents the results of this analysis for the 2015 data. As shown in Table A.8-2, tree and shrub density is slightly higher (0.3 percent) in more-resourced tracts than it is in less-resourced tracts. This difference, while small, is statistically significant.

Descriptive statistics derived from equal samples of less-resourced tracts (n= 319) and more-resourced tracts (n= 319) indicate that more-resourced tracts have slightly more tree and shrub coverage (mean = 12.9%; median = 11.5%) than less-resourced tracts (mean = 11.2%; median = 10.3%). The means described here differ slightly from the means reported in Table A.8-2 due to the sample size used for the statistical analysis. Although statistical analysis conducted with an independent two-sample t-test assuming unequal variance (more-resourced = 0.009; less-resourced = .003) indicates that the difference in coverage is statistically significant ($t(501) = 2.71$, $p = 0.007$), the effect size calculated using Cohen's *d* (0.22) indicates the magnitude of difference between the two groups is small.[1]

[1] Gail M. Sullivan, Richard Feinn, (2012) Using Effect Size—or Why the P Value Is Not Enough. Journal of Graduate Medical Education: September 2012, Vol. 4, No. 3, pp. 279-282.

Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed	
INDICATOR	METRIC
Proportionate implementation of climate change adaptation strategies	*Relative value of tree and shrub density between less resourced parts of the community and more resourced parts of the community*

Trend Analysis

As noted above, there are no earlier analogous tree and shrub data available. The trend in tree and shrub density overall, as well as trends within less-resourced or more-resourced areas of the watersheds, therefore cannot be assessed at this time. As a result, the trend is shown as a qualitative neutral rating.

A similar type of index has been calculated for the City of Los Angeles based on data collected around the same time[2] and provides an interesting point of comparison. The Green View Index differs from the SAWPA tree and shrub density data in that it uses Google Street View panoramas instead of satellite imagery, and rates the percentage of canopy coverage in an area on a scale from 1 to 100 based on these street-level perspectives. The SAWPA tree and shrub density data only included residential areas, as described above, and so may exclude some areas that the Green View Index would include (such as commercial streets) while also including some areas the Green View Index would exclude (such as vegetated areas located closer to the center of city blocks). For purposes of comparison, the City of Los Angeles was considered the most similar geography to which the Green View Index has been applied. As of 2015, the Green View Index for the City of Los Angeles was 15.2%.

Going Forward

As more data relevant to climate change adaptation becomes available, another metric may better reflect the proportionality of conditions or implementation of climate change adaptation strategies in the region across less- and more-resourced parts of the community.

While mean values were used in this assessment to determine statistical significance, the use of median values may be more appropriate in the future.

[2] The Green View Index was developed by the Massachusetts Institute of Technology Senseable City Lab. The Green View Index is calculated using Google Street View panoramas. http://senseable.mit.edu/treepedia/cities/los%20angeles.

Educate and build trust between people and organizations	
INDICATOR	**METRIC**
Collaboration for more effective outcomes	***Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation.***

Implementation Approach

Collaboration for more effective outcomes was assessed by reviewing the list of entities regulated in adopted total daily maximum load (TMDL) orders in the Santa Ana Region and identifying how many are participating in collaborative efforts to comply with the TMDL requirements. Participation is indicated by financial or in-kind contributions. Conditions for collaboration were considered "good" if the number of participants was substantially the same as the number of regulated entities and "bad" if the number was not, for both recent and prior conditions. An evaluation was then made to determine whether the sequencing of prior to recent conditions warranted a positive, neutral, or negative trend finding according to **Table A.9-1**.

The "good" – "bad"-based scoring system is reflective of trends but configured to highlight conditions status relative to full participation rather than expecting continued improvement beyond full participation. Participation by equal to or greater than 80% of the regulated entities was considered "good."

TABLE A.9-1
GOOD-BAD ASSESSMENT SYSTEM

Prior Conditions	Recent Conditions	Result
GOOD	GOOD	Positive
BAD	GOOD	Positive
GOOD	BAD	Negative
BAD	BAD	Neutral (if appreciably better)
BAD	BAD	Negative (if similar or worse)

Desired Output

The targeted output was the percentage of entities regulated by adopted TMDLs who have made financial or in-kind contributions to TMDL implementation in the past year.

Data Sources

The Santa Ana Region's website summarizing TMDLs for the region, along with the region's Water Quality Control Plan, were reviewed to identify TMDLs in the implementation phase. Financial or in-kind contributions determined by reviewing:

- SAWPA Task Force contribution records
- Newport Bay Watershed Executive Committee reports

Educate and build trust between people and organizations	
INDICATOR	**METRIC**
Collaboration for more effective outcomes	*Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation.*

Detailed Implementation Steps

The Santa Ana Region Basin Plan was reviewed to identify the TMDLs in an implementation phase in the region. The total number of entities regulated by the TMDLs was determined by reviewing the list of permittees identified in each relevant order from the RWQCB. Recent records of contributions to TMDL implementation efforts were collected from SAWPA and the Newport Bay Watershed Executive Committee reports. A list of entities that have contributed to these efforts in the past year was compiled from these sources. The list of entities that have contributed to implementation of each TMDL (entities are counted once for each TMDL – that is, if the same entity is named in two TMDLs, it is counted twice) was compared with the list of entities named in the relevant order from the RWQCB, and a percentage of entities participating was calculated based on the comparison. The percentage of entities participating was converted into a good or bad score, and the trend was determined based on the comparisons shown in **Table A.9-1**.

Implementation Challenges

In some cases, the adopted orders included entities that no longer exist, or that have already completed their implementation activities (and so no longer participate despite the ongoing TMDL implementation plan).

In some cases, the data does not change annually. The cost-sharing agreement for the Newport Bay Sediment TMDL was last updated in 2014. The same agencies have been splitting the cost of implementing projects to address sediment and related water quality issues since 2014. The cost-sharing agreement for all other TMDLs for Newport Bay and San Diego Creek had been entered into in 2015 and was undergoing revision as of summer 2018.

Results

Positive trend

89% participation (62 out of 70 entities) in 2017

89% participation (62 out of 70 entities) in 2016

Trend Discussion

In the Santa Ana region, 70 participants are named in adopted TMDLs in the implementation phase, summarized in **Table A.9-2**. This number does not include entities named in the recently adopted selenium TMDL for San Diego creek or entities named as part of the completed Agricultural Nutrient Management Program in Newport Bay. Of these entities named in the orders, 62 participated (as measured by financial contributions to implementation projects) in TMDL implementation-related efforts in 2017. The same number participated in 2016. This amounts to a participation rate of 89 percent for both years; therefore, in both years collaboration was in "good" condition.

Educate and build trust between people and organizations	
INDICATOR	**METRIC**
Collaboration for more effective outcomes	*Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation.*

Nearly all of the TMDL implementation plans are being implemented in part through a collaborative entity, such as a SAWPA Task Force, the Newport Bay Watershed Executive Committee, and the Orange County Stormwater Program.

Going Forward

In the future, SAWPA may want to track the percent of TMDL activities implemented in partnership annually, which could provide similar, more complete information about collaboration relevant to water management in the watershed. SAWPA could conduct an annual survey of TMDL permittees to identify projects undertaken as part of TMDL implementation plans during the year. SAWPA could then more clearly identify which of the TMDL projects were completed by two or more entities (instead of one entity), reflecting collaboration in the watershed.

References

Newport Bay Watershed Executive Committee, *Central Orange County Watershed Management Area Executive Action Plan 2017-22*, September 20, 2017.

Santa Ana Watershed Project Authority, Task Force Contribution Data.

Educate and build trust between people and organizations	
INDICATOR	**METRIC**
Collaboration for more effective outcomes	***Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation.***

TABLE A.9-2
303(D) LIST WATER BODIES IN THE REGION WITH TMDL IMPLEMENTATION PLANS AND PARTICIPATING AGENCIES/DISCHARGERS

Water Body	Pollutants	303(d) Listing Status	Collaborative Entity	Entities Included in TMDL (total number) [a]	TMDL Entities Contributing Financially or In-Kind (total number), 2017 or last year information is available [a]
Big Bear Lake	Noxious aquatic plants, nutrients	5B, being addressed by USEPA approved TMDL	Nutrient TMDL working group	**US Forest Service**, **Caltrans**, San Bernardino County, San Bernardino County Flood Control District, City of Big Bear Lake, Big Bear Mountain Resorts (6)	San Bernardino County, San Bernardino County Flood Control District, City of Big Bear Lake and Mammoth Mountain *formerly the Ski Resorts* (4)
Canyon Lake	Nutrients (nonpoint source)	4a, addressed by USEPA approved TMDL *Resolution R8-2004-0037*	SAWPA Task Force	**US Forest Service**, March Air Reserve Base, March Joint Powers Authority, Caltrans, California Department of Fish and Game, County of Riverside, cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside, and Beaumont, Eastern Municipal Water District, Elsinore Valley Municipal Water District, **concentrated animal feeding operators** and other agricultural operators within San Jacinto watershed (19)	March Air Reserve Base, March Joint Powers Authority, Caltrans, California Department of Fish and Game, County of Riverside, cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside, Beaumont, **Menifee**, and **Wildomar**, Eastern Municipal Water District, Elsinore Valley Municipal Water District, San Jacinto Agricultural Operators (19)
Chino Creek Reach 1A	Indicator bacteria	5B, being addressed by USEPA approved TMDL *Resolution R8-2005-0001*	SAWPA Task Force (Middle Santa Ana River [MSAR] Task Force)	**US Forest Service**, the County of San Bernardino, the County of Riverside, the cities of Ontario, Chino, Chino Hills, Montclair, Rancho Cucamonga, Upland, Rialto, Fontana, Norco, Riverside, Corona, Pomona and Claremont, and agricultural operators in the watershed (17)	San Bernardino County Flood Control, the County of Riverside, the cities of Ontario, Chino, Chino Hills, Montclair, Rancho Cucamonga, Upland, Rialto, Fontana, Norco, Riverside, Corona, Pomona, Claremont, **Eastvale, Jurupa Valley**, and agricultural operators in the watershed *represented by the Chino Basin Watermaster Agricultural Pool* (18)
Chino Creek Reach 1B	Indicator bacteria	5B, being addressed by USEPA approved TMDL	SAWPA Task Force (MSAR Task Force)	Same as Chino Creek Reach 1A	
Chino Creek Reach 2	Indicator bacteria	5B, being addressed by USEPA approved TMDL	SAWPA Task Force (MSAR Task Force)	Same as Chino Creek Reach 1A	
Lake Elsinore	Nutrients, Organic enrichment/low dissolved oxygen	5B, being addressed by USEPA approved TMDL	SAWPA Task Force (combined with Canyon Lake)	Combined with Canyon Lake	
Mill Creek (Prado Area)	Indicator bacteria	5B, being addressed by USEPA approved TMDL	SAWPA Task Force (MSAR Task Force)	Same as Chino Creek Reach 1A	

Educate and build trust between people and organizations	
INDICATOR	**METRIC**
Collaboration for more effective outcomes	***Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation.***

Water Body	Pollutants	303(d) Listing Status	Collaborative Entity	Entities Included in TMDL (total number) [a]	TMDL Entities Contributing Financially or In-Kind (total number), 2017 or last year information is available [a]
Newport Bay [b]	Fecal coliform	5B, being addressed by USEPA approved TMDL *Resolution 99-10*	Newport Bay Watershed Executive Committee	County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest and Newport Beach and **agricultural operators in the Newport Bay watershed** (9)	County of Orange, **Orange County Flood Control District,** the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest, Newport Beach, **Laguna Hills,** and **Laguna Woods, Irvine Ranch Water District,** and the **Irvine Company** (13)
	Nutrients	5B, being addressed by USEPA approved TMDL *Resolution 98-100*	Urban Stormwater Permittees - Environmental Monitoring Division of OC Public Works/Environmental Resources implements monitoring programs (Orange County Stormwater Program)	County of Orange, the Orange County Flood Control District, and the 34 cities of Orange County *referred to as the Co-Permittees of the Areawide Urban Stormwater Permit (3)*	County of Orange, the Orange County Flood Control District, and the 34 cities of Orange County (3)
			Agricultural Nutrient Management Program completed 2000-2003	Orange County Farm Bureau, UC Cooperative Extension, and agricultural operators (agricultural nutrient management program) (3)	*Agricultural Nutrient Management Program completed 2000-2003*
	Sediment	5B, being addressed by USEPA approved TMDL	Newport Bay Watershed Executive Committee	County of Orange, the Cities of Irvine, Tustin, Lake Forest, **Costa Mesa, Santa Ana**, and Newport Beach (7)	County of Orange, **Orange County Flood Control District**, the Cities of Irvine, Tustin, Lake Forest, Newport Beach, **the Irvine Company** (7)
Newport Bay, upper	Diazinon and Chlorpyrifos	5B, being addressed by USEPA approved TMDL *Resolution R8-2003-0039*	Newport Bay Watershed Executive Committee	County of Orange, the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest, and Newport Beach, and **agricultural operators in the Newport Bay watershed** (9)	County of Orange, **Orange County Flood Control District,** the Cities of Tustin, Irvine, Costa Mesa, Santa Ana, Orange, Lake Forest, Newport Beach, **Laguna Hills,** and **Laguna Woods, Irvine Ranch Water District,** and the **Irvine Company** (13)
Prado Park Lake	Indicator bacteria	5B, being addressed by USEPA approved TMDL	SAWPA Task Force (MSAR Task Force)	Same as Chino Creek Reach 1A	
San Diego Creek Reach 1	Nutrients	5B, being addressed by USEPA approved TMDL	Newport Bay Watershed Executive Committee	Same as Newport Bay Addressed as part of Newport Bay Nutrients TMDL, listed previously	
	Pesticides	5B, being addressed by USEPA approved TMDL	Newport Bay Watershed Executive Committee	Same as Newport Bay Addressed as part of Newport Bay Diazinon and Chlorpyrifos TMDL, listed previously	
	Siltation/Sediment	5B, being addressed by USEPA approved TMDL	Newport Bay Watershed Executive Committee	Same as Newport Bay Addressed as part of Newport Bay Sediment TMDL, listed previously	

Educate and build trust between people and organizations	
INDICATOR	**METRIC**
Collaboration for more effective outcomes	***Percent of entities regulated by a total maximum daily load (TMDL) that have made financial or in-kind contributions to TMDL implementation.***

Water Body	Pollutants	303(d) Listing Status	Collaborative Entity	Entities Included in TMDL (total number) [a]	TMDL Entities Contributing Financially or In-Kind (total number), 2017 or last year information is available [a]
	Selenium	5B, being addressed by USEPA approved TMDL	No	MS4 permittees, other NPDES permittees (groundwater cleanup/dewatering permittees), IRWD (operator of IRWD constructed treatment wetlands), UC Irvine (operator of UCI San Joaquin Marsh Reserve wetlands) (4)	Order adopted in 2017
San Diego Creek Reach 2	Nutrients	5B, being addressed by USEPA approved TMDL	Newport Bay Watershed Executive Committee	Same as Newport Bay Addressed as part of Newport Bay Nutrients TMDL, listed previously	
	Sediment/siltation	5B, being addressed by USEPA approved TMDL	Newport Bay Watershed Executive Committee	Same as Newport Bay Addressed as part of Newport Bay Sediment TMDL, listed previously	
Santa Ana River Reach 3	Indicator bacteria	4a, addressed by USEPA TMDL	SAWPA Task Force (MSAR Task Force)	Same as Chino Creek Reach 1A	

NOTES:

[a] Bolded text in these columns identifies entities that are not listed in both columns.

b Newport Bay Watershed Executive Committee cost sharing agreements for TMDLs were entered into in 2014 (for Sediment TMDL) and 2015 (for all other TMDLs).

SOURCE: Newport Bay Watershed Executive Committee, *Central Orange County Watershed Management Area Executive Action Plan 2017-22*, September 20, 2017; Santa Ana Watershed Project Authority Task Force Contribution Data.

Educate and build trust between people and organizations	
INDICATOR	METRIC
Adoption of a watershed ethic	*Total gallons of potable water used per capita per day*

Implementation Approach

This indicator and metric were assessed using water use and population data from the SWRCB Large Water System Drinking Water Program Electronic Annual Report and from the Department of Water Resources (DWR) Public Water Systems Statistics (PWSS) survey.

Annual water use generally fluctuates in response to water year type (wet or dry). In order to separate changes in water use due to adoption of a watershed ethic from responses to annual water availability, for trend analysis and scoring purposes the value of this metric is compared with the average value calculated over the last ten years. The percent difference between the two values is the result used for rating according to the criteria shown in **Table A.10-1** below.

TABLE A.10-1
TREND RATING SYSTEM

Rating	Criterion
Positive	Result ≥ 10% decline
Neutral	-10% < Result < 10%
Negative	Result ≥ 10% increase

Output

The output for this metric is the average gallons per capita per day (GPCD) for the watershed for the most recent year compared to the average GPCD of the previous 10 years of data.

Data Sources

Prior to 2013, DWR collected the water agency data used in this indicator (via the voluntary PWSS survey). Starting in 2013, the PWSS data was derived from the mandatory reports by water suppliers to the SWRCB Large Water System Drinking Water Program Electronic Annual Report, which was expanded to include the water use data previously submitted to the PWSS. The assessed water suppliers were limited to those which had over 3,000 water meters or that served customers over 3,000 acre-feet of potable water (i.e., retailers required to prepare Urban Water Management Plans). As of 2013, these 53 suppliers serve approximately 98 percent of the watershed's population. Between 2007-2012, at least 46 out of the 53 retailers reported their water use and population to DWR's PWSS. While the retailers that did not report during the 2007-2012 period changed annually, the populations excluded were generally split between inland and coastal areas such that the GPCD reported between 2007-2012 is not skewed by local climate conditions. Because the GPCD is calculated based upon the water use and population of the reporting agencies and there was not a geographic skew in the 2007-2012 data, it was determined that comparing the GPCD for the most recent year with the average calculated over the 2007-2016 was appropriate.

Educate and build trust between people and organizations	
INDICATOR	METRIC
Adoption of a watershed ethic	*Total gallons of potable water used per capita per day*

While total production data is available in the PWSS data, inconsistencies and potential double-counting were noted in the data. For this reason, the average GPCD was calculated using total urban delivered water instead of total water production data. The result of the trend calculation is similar using total production data.

Detailed Implementation Steps

The total GPCD for most users in the watershed was calculated based on the reported total annual potable water delivered for urban uses (residential, commercial, industrial, urban land irrigation, and other urban uses) reported in the PWSS data for each retailer, along with the total population served by each retailer.

Total annual GPCD = (urban water deliveries)*(conversion factor to convert from acre-feet to gallons) / (Population*365 [or 366 for leap year])

The 2007-2016 average GPCD was calculated by calculating the average population between 2007-2016 and the average of total delivered urban water (as defined above) during 2007-2016, then substituting those average values into the total annual GPCD equation.

Some quality control processing of the data was required to ensure data were consistent and comparable. Data quality control steps included confirming the units (acre feet versus million gallons, for example), confirming the annual value by cross-checking against a sum of monthly values, and identifying outlier data by comparing against previous years' data.

Implementation Challenges

While multiple years of data were available for this indicator, the data quality varied. Approximately 10 percent of the records used to calculate the GPCD had a quality control issue requiring adjustment. In some cases, monthly data was unavailable for select retailers. Reported monthly totals and annual totals did not align. Some data values were clear outliers, potentially indicating inaccurate data entry. Units were also sometimes mismatched (for example, gallons entered into a column which should have been reported in acre-feet).

Results

GPCD (urban water deliveries) in 2017 compared with the ten-year average (2007-2016):

Positive trend (decline of 16%, from 171 to 144)

Trend Analysis

The last available total GPCD data records water use during 2017. In 2017, on average, 144 gallons of water was delivered to urban uses per capita in the watershed each day. This rate of usage is less than the ten-year average (2007-2016) of 171 gallons per capita per day, and represents a decline of approximately 16 percent relative to the ten-year average.

Educate and build trust between people and organizations	
INDICATOR	METRIC
Adoption of a watershed ethic	*Total gallons of potable water used per capita per day*

As shown in Table **A.10-2**, this is the high end of the range of year over year percent change for the period 2007-2016, and is similar in magnitude of decline to the decrease in use between 2014-2015, when mandatory restrictions on water use were enacted statewide. For these reasons, this is considered a significant decline in water use (or increase in water conservation). Between 2016 and 2017, total urban delivery GPCD increased by approximately four gallons per day (or about three percent), within range of interannual variability.

TABLE A.10-2
GALLONS PER CAPITA PER DAY

Year	Retailers	Population	Year over year change (percent)	Gallons per Capita per Day (GPCD) a
Annual				
2007	46	4,476,497	n/a	226
2008	47	4,776,264	-13	195
2009	47	4,785,041	-4	187
2010	49	5,253,274	-10	167
2011	47	5,036,077	-1	166
2012	47	5,028,565	5	174
2013	53	5,544,576	-5	166
2014	53	5,657,352	0	167
2015	53	5,765,113	-16	141
2016	53	5,846,144	-1	139
2017	53	5,967,921	3	144
Averages				
Average of the Previous Ten Years of Data (2007-2016)a	50	5,216,132	-	171

NOTES:

[a] Prior to 2013, urban delivered water information was not required for all water retailers; for this reason, the urban delivered water volumes from 2007 to 2012 do not include data from all of the retailers that began reporting in 2013.

SOURCE: Department of Water Resources, Public Water Systems Statistics data from 2007 to 2016; State Water Resources Control Board (SWRCB), Large Water System Drinking Water Program Electronic Annual Report, data for 2017.

Going Forward

Future implementation of this metric could compare the annual value to a ten-year moving average value. As consistent data is collected, the period of the moving average could extend (for example, up to fifteen years instead of ten).

Given that the PWSS data is collected from the SWRCB Large Water System Drinking Water Program Electronic Annual Report, future implementation of this indicator would likely collect data directly from the SWRCB system instead of using the PWSS dataset. Quality control testing

Educate and build trust between people and organizations	
INDICATOR	METRIC
Adoption of a watershed ethic	*Total gallons of potable water used per capita per day*

of the reported data (in either the SWRCB system or the PWSS system) would allow for improved accuracy of this indicator in the future.

A validation step not taken with this implementation but potentially valuable in future implementations would be to compare the values from this data to the values reported in the Urban Water Management Plans of relevant agencies.

References

Department of Water Resources (DWR), Public Water Systems Statistics data from 2007 to 2016.

State Water Resources Control Board (SWRCB), Large Water System Drinking Water Program Electronic Annual Report, data for 2017.

Improve data integration, tracking and reporting to strengthen decision-making	
INDICATOR	METRIC
Broaden access to data for decision-making	*Percent of watershed population in agencies whose residential customers receive relative performance information about their water use*

Implementation Approach

This indicator recognizes that since everyone who uses water is a decision-maker, it is important to have broad and easy access to data for decision-making. Residential customer bills provide prior month water use consumption for billing purposes, but they also provide the opportunity to transmit information on how the billed usage compares to past usage, conservation or efficiency targets, or water budget amounts. The underlying assumption for this indicator is that informing water consumers how they are using water relative to past or targeted/budgeted use will improve decisions and increase efficiency. The metric for the current assessment is a simple yes/no survey of the watershed's retail water supply agencies to determine if their residential customers' bills provide relative performance information (i.e., quantitative contextual water use information the customer can compare to their current measured water use).

Output

The metric is expressed as the percentage of the total watershed population served by retail supply agencies that provide customers relative performance information about their water use on their bills.

Data Sources

The assessment is limited to the 53 retail water suppliers that have over 3,000 water meters or that serve customers over 3,000 acre-feet of potable water (i.e., retailers required to prepare Urban Water Management Plans). The population of the surveyed agencies was obtained from the population reported to the State Water Resources Control Board (SWRCB) Large Water System Drinking Water Program Electronic Annual Report. These 53 retailers serve nearly 98% of the Santa Ana River watershed's population.

The assessment was based upon information about residential customer billing found on agency web-sites, retrieved by contacting the retail agency directly by phone or email, and through information provided by their wholesale supplier.

Detailed Implementation Steps

The retailers were assessed to determine if relative water use information is provided to the customers on a bill (either hard copy or made available in a customer on-line account), or in an app, and which informs the customer about how their current measured water use compares to any of the following:

Improve data integration, tracking and reporting to strengthen decision-making	
INDICATOR	METRIC
Broaden access to data for decision-making	*Percent of watershed population in agencies whose residential customers receive relative performance information about their water use*

a) previous water use, such as the same month in the previous year, or the previous month's usage – ideally at least 3 or months, or

b) a water use target or usage/budget tier used for billing, or

c) their neighborhood use or use by similar customers.

The following steps were taken to procure the information, which was recorded on a spreadsheet as a yes/no answer based upon the above criteria.

1. Examine the retailer web-site for information about residential customer bills. A search of "how to read your bill" often displayed a copy of a generic bill.

2. If the generic bill was not available, some retailer sites described the water use information available to a customer an on-line account would provide.

This method procured the yes/no information from 38 out of the 53 retailers.

Eleven out of the 15 retailers that did not provide enough information on their web-site to make a yes/no determination were contacted by senior staff of their respective wholesale supply agency. Lisa Morgan-Perales of Inland Empire Utilities Agency (IEUA), senior water resource analyst, reached out to four IEUA retailers. All the IEUA retailers responded by phone or email after a little prodding by Lisa; agency staff who were reached by phone provided useful context information such as how their billing systems were about to be updated or that conservation targets were added to the bill during the drought. Joe Berg, Director of Water Use Efficiency Coordinator at Municipal Water District of Orange County (MWDOC), contacted seven MWDOC retailers; four of them eventually responded by email after follow-up was conducted.

The four remaining retailers were contacted by phone and email by a SAWPA intern. Two out of the four responded.

Implementation Challenges

It was expected that most retailers would provide some kind relative performance information on their residential bills. Initially the survey intended to also evaluate the different methods retailers used to provide relative water use and real-time water use information to customers, including traditional billing apps, such as Water Smart or DropCountr, or real-time usage based upon AMI/AMR systems. It was quickly determined that gathering such data would be too time-consuming without developing a formal survey with the input of SAWPA wholesalers and retailers. The time and effort to procure responses from the retailers that did not provide the needed information on their website was more than initially expected, and it was still not successful in yielding responses from five of the retailers. Although a few of the retailer websites

Improve data integration, tracking and reporting to strengthen decision-making	
INDICATOR	METRIC
Broaden access to data for decision-making	*Percent of watershed population in agencies whose residential customers receive relative performance information about their water use*

required considerable amount of searching to determine the yes or no answer, it was fortunate that the determination could be made from the websites of 70% of the retailers.

Results

The assessment found that 84% of watershed's population[1] are served by retailers that provide residential customers information on their bill about how their current water use compares to past water use and/or water use budgets or targets. The percentage is likely higher than 84%, since about 8% of the watershed population are in retail agencies that did not respond to the assessment/survey.

Trend Analysis

This is the first time the retail agencies were assessed on this topic, therefore there is no previous information available to quantitatively assess a trend for this metric. In the past decade, evidence from a few retailers suggests the adoption of conservation-focused rate structures, including water budget-based rates, mandatory water use restrictions during the drought, and retail agency efforts to promote water efficiency and meet legislative mandates to reduce per-capita use likely stimulated retailers to provide more relative water use information to residential customers, although many retailers already provided basic information about past water use on their residential customer bills.

Going Forward

The next assessment of retailers about the relative water use information provided to customers should be conducted as a survey. Consideration should be given to including multi-family residential and non-residential customer classes, as well as surveying the different methods retailers use to provide that information to the different customer classes. It would likely require a simple but well-publicized survey instrument as well identification of the right staff person at the retail supplier to whom the survey should be sent. The watershed wholesalers should also be involved in promoting the survey. The survey questions could also be designed for possible inclusion on the State Water Resources Control Board's Large Water System Drinking Water Program Electronic Annual Report (SWRCB EAR), which currently includes questions about retailer rate structures and affordability.

[1] About 2% of the population are served by retailers too small to assess.

Improve data integration, tracking and reporting to strengthen decision-making	
INDICATOR	METRIC
Participation in an open data process	*Percent of watershed population in agencies participating in establishment of a regional data sharing system*

Implementation Approach

The Data Management Pillar recognized that the first step in the process of creating a "federated" regional data sharing system in the SAWPA region is the establishment of a regional trust framework designed to establish trust between agencies as well as trust in the functionality of data management systems. Because a commitment to establish the trust framework has not yet been made, this metric cannot be quantitatively assessed. Once the commitment is made, the metric will be assessed by calculating the percentage of the total watershed population in the service areas of water supply and water management agencies participating in the trust framework.[1] After the first step of the commitment to the trust framework, the second step, establishing the regional data framework and data sharing system will be assessed. The assessment of this second step will be based upon calculating the percentage of the total watershed population by retail water suppliers that are participating in the establishment regional data sharing system. The retailer engagement is essential for federated regional data sharing since their supply and demand data are core data in the assessment of water management in region. The two steps of this metric can be combined into one score by averaging the percentage values of the two steps.

Output

The metric's first step is expressed as the percentage of the total watershed population served by the agencies that have committed to participating in the trust framework. The metric's second step is the percentage of the total watershed population served by retail water suppliers participating in the establishment of a regional data sharing system. The calculated percentages from the two steps are averaged to result in one score.

Data Sources

Information on commitment to a trust framework may ultimately be available from a formal source, but in the meantime will require communication with leaders of trust framework organizations. Similarly, identification of retail water suppliers participating in the establishment of a regional data sharing system will require communication with leaders of any emerging regional data sharing organizations.

The population of the participating retail agencies can be obtained from the population reported to the State Water Resources Control Board (SWRCB) Large Water System Drinking Water

[1] The water management agencies could wastewater, flood control, and groundwater management agencies.

Improve data integration, tracking and reporting to strengthen decision-making	
INDICATOR	METRIC
Participation in an open data process	*Percent of watershed population in agencies participating in establishment of a regional data sharing system*

Program Electronic Annual Report. The participating retail agencies is not limited to the retailers that have over 3,000 water meters or that serve customers over 3,000 acre-feet of potable water (ones that file Urban Water Management Plans). The population of wholesale supply agencies and other water management agencies can be obtained from the websites of the individual agencies and SAWPA.

Detailed Implementation Steps

A detailed description of the implementation steps cannot be provided since the quantification of the metric could not be completed at this time.

Implementation Challenges

It could be a challenge to engage the small, less-resourced retail water agencies, including cities, to engage in establishing a trust framework, data management framework and a data sharing system. The better-resourced state, regional and local management agencies and regulators to whom retail suppliers are required to report need to effectively make the case that the effort will eventually create time and labor efficiencies if it reduces duplicative reporting and increases the quality of collected and reported data.

Results

The metric cannot be quantitatively assessed at this time.

Trend Analysis

Even though a trend for this metric cannot be established due to an absence of progress for this metric, it is notable that the majority of the watershed population are in wholesale and retail water supply agencies that have taken initial steps towards establishing regional data sharing systems by engaging with the implementation of the Open and Transparent Water Data Act (AB 1755) and/or participating in the California Data Collaborative.

For the current assessment, where data is lacking to show a trend, a qualitative neutral status is identified as the rating.

Going Forward

The region should look for opportunities to help stimulate the establishment of a trust framework and a federated data sharing system for the watershed. One opportunity is encouraging the watershed's water supply retailers to engage with DWR's Public Water System Statistics survey and the State Water Resources Control Board's Large Water System Drinking Water Program Electronic Annual Report (SWRCB EAR) about the water supply and demand data those reports require, to ensure that it is more usable for both State and regional planning efforts. Another opportunity may be developing a constituency for an AB 1755 use case in the watershed to 1) assist SAWPA's effort to track the progress of the OWOW Plan towards its goals with indicators and metrics, and 2) implement a California Water Plan Sustainability Outlook for the watershed, for which DWR has been supportive.

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OWOW STEERING COMMITTEE MEMORANDUM NO. 2019.4

DATE: January 24, 2019

TO: OWOW Steering Committee

SUBJECT: Completion of the One Water One Watershed (OWOW) Plan Update 2018

PREPARED BY: Mike Antos, Senior Watershed Manager

RECOMMENDATION
It is recommended that the OWOW Steering Committee consider recommending the One Water One Watershed (OWOW) Plan Update 2018 be adopted by the SAWPA Commission.

DESCRIPTION
The One Water One Watershed Plan Update 2018 is complete. Developed from the OWOW 2.0 Plan over the past three years by stakeholders from across the watershed, the OWOW Plan Update 2018 is ready to be approved as the Integrated Regional Water Management Plan for the Santa Ana River watershed. The OWOW Plan Update 2018 is compliant with the 2016 IRWM Plan Standards released by the Department of Water Resources (DWR), and stands ready, once approved by the SAWPA Commission and DWR, to make all included projects eligible for state grant funding.

During public review, SAWPA received comments from seven organizations or individuals, five of which were brief, editorial in nature, and incorporated with small changes. Two were more extensive comments. The first, from the Center for Biological Diversity, was addressed by the Natural Resources Stewardship Chair and SAWPA staff with moderate changes in the Pillar subchapter, and within the Watershed Setting Chapter. The second, from Orange County Public Works, reiterated comments previously provided about the OWOW Program. Addressing these comments is ongoing and did not result in changes to the OWOW Plan Update 2018, although Orange County input throughout the update process has resulted in changes to the project selection process the Steering Committee will use for grants.

The completed Plan is over 400 pages and will be loaded onto the SAWPA website (www.sawpa.org/owow) before January 24, 2018. When that upload occurs, a public notice will be circulated. Several printed copies will be available at the OWOW Steering Committee meeting, and each Committee member will receive a thumb drive with a digital copy of the OWOW Plan Update 2018.

BACKGROUND
As an Integrated Regional Water Management Plan, the OWOW Plan Update 2018 must be adopted following a Public Hearing by the SAWPA Commission, which is the approved Regional Water Management Group for the Santa Ana Funding Area. The OWOW Steering Committee is delegated the responsibility of completing the plan updates and developing suites of projects for submittal with the plan, and to available implementation grant rounds. The action

by the OWOW Steering Committee today advises the SAWPA Commission the status of the OWOW Plan Update 2018. If adoption is recommended, SAWPA Commission will notice and agendize a Public Hearing during an upcoming meeting to consider adoption.

ATTACHMENTS:

1. Cover and Executive Summary of the One Water One Watershed Plan Update 2018

One Water One Watershed Plan Update 2018

Moving forward together

Santa Ana River Watershed

EXECUTIVE SUMMARY

The One Water One Watershed Plan Update 2018 describes how collaborative watershed planning, water and land management, and project implementation supports improved sustainability, resilience, and quality of life throughout the Santa Ana River Watershed through 2040.

This One Water One Watershed (OWOW) Plan Update 2018 is the Integrated Regional Water Management (IRWM) Plan for the Santa Ana River Watershed (watershed). The OWOW Plan Update 2018 was written by and for stakeholders throughout the watershed. This plan considers the challenges and opportunities facing the entire watershed area of the Santa Ana Funding Region within the California IRWM Program. By inviting together stakeholders from all subregions, political jurisdictions, water agencies, non-governmental organizations, businesses, and the public, this OWOW Plan Update 2018 addresses all types of water as a single resource, inextricably linked to people, the land, and nature.

This plan is built on the strong foundations laid by the OWOW Plan, adopted in 2010, and the OWOW 2.0 Plan, adopted in 2014. These two earlier efforts were lauded within the watershed, across California, and the country. The OWOW 2.0 Plan received awards from planners, engineers, and business leaders for its good governance and stakeholder-led process.

The OWOW Plan Update 2018 was begun in July 2016 with a meeting of the OWOW Steering Committee. At that meeting, the Committee approved efforts to secure a planning grant from the state in support of the update process and adopted a policy document that described how projects can be included in the OWOW Program and made eligible for the expected implementation grants.

In the 28 months that followed, the OWOW 2.0 Plan was reconsidered in light of the significant changes impacting the watershed since early 2014. In those years the fiscal recovery began to be felt in portions of the watershed, and the State of California went through one of its most severe droughts on record. The communities of the watershed made strides to support conservation as a way of life in California, implementing widespread landscape retrofits and other conservation programs. Other significant investments were made throughout the watershed by agencies, cities, counties, and community members alike to make the watershed more resilient in response to uncertainty and more sustainable over the long term.

The OWOW Plan Update 2018 is subtitled "Moving Forward Together" to mirror the earlier plans, which focused on movement toward goals. Working together has been fundamental to the OWOW Program (and SAWPA) since the program's inception, and the OWOW Plan Update 2018 is built by the stakeholders for the stakeholders. "Moving Forward Together" also reflects the OWOW Program's commitment to ensuring that no one is left behind as progress is made, and that progress somewhere in the watershed does not cause any undue burden elsewhere in the watershed.

The Santa Ana Watershed Project Authority (SAWPA) is once again proud to facilitate the OWOW Program on behalf of all communities, waters, and lands across the watershed, and to present this OWOW Plan Update 2018.

OVERVIEW

The Santa Ana River Watershed faces enormous challenges adapting to changing conditions, many of which are at an unprecedented scale in its modern history. The watershed's population, already one of the most densely populated in the State, continues to grow and urbanize, increasing demands on water supply, water quality, and flood management. Climate change, population growth, the aging of infrastructure, and new awareness of environmental degradation affect how we manage water for the future.

Most agree that the water management approaches of the past fifty years are no longer sustainable in today's environment and economic climate. And most also agree that a more integrated and collaborative approach to water resource management shows tremendous promise for achieving sustainable water management everywhere. In the Santa Ana River Watershed, this approach is not new; it has been our practice and legacy since the first integrated plan was approved by the SAWPA Commission in 1998.

The goal of yesteryear was affordable water for a growing economy. Over time, the goal has changed to the complicated balancing act of environmental sustainability, quality of life and, economic growth in a changing environment dominated by water and financial scarcity. The strategy to achieve this goal is integrated water management. This means the various silos of water supply, flood management, water quality, ecosystem restoration, and recreation are brought together as one.

> ***SAWPA's approach—coordination, cooperation, and integration of water agencies to pool resources and manage water at the basin scale—is one of California's best models for integrated water management.***
>
> **—Public Policy Institute of California 2011, "Managing California's Water – From Conflict to Reconciliation"**

This approach ensures better coordination across functions that are often managed separately and across a broader geographic scale larger than the boundaries of individual agencies. Through integration at the watershed scale, economic and environmental performance is more effectively balanced. This water resource planning approach based on a watershed scale has even been recognized by independent review by objective and nonpartisan research organizations such as the Public Policy Institute of California, which cited SAWPA as an excellent example of integrated water management in the state.

VISION

To guide the development of the initial OWOW Plan, stakeholders in 2007 established a vision, goals, and objectives for the watershed. In those first planning sessions, a shared purpose was

formed that underlies the rest of the plan and the projects and programs that are prioritized for implementation. This initial vision has been adjusted over time with each successive OWOW Plan.

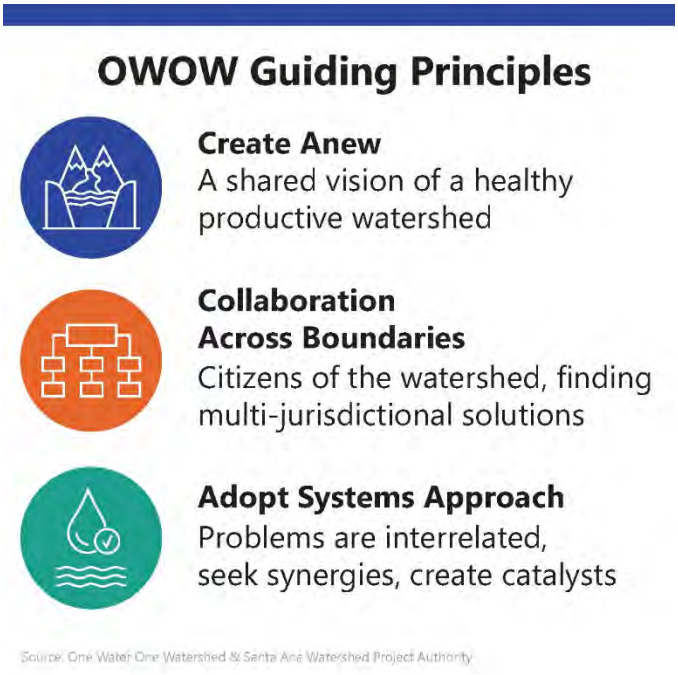
Today, the vision of the OWOW Program is a watershed that:

- Is sustainable, droughtproof, and salt balanced by 2040
- Avoids and removes interruptions to natural hydrology, protecting water resources for all
- Uses water efficiently, supporting economic and environmental vitality
- Is adapted to acute and chronic climate risk and reduces carbon emissions
- Works to diminish environmental injustices
- Encourages a watershed ethic at the institutional and personal level

The OWOW Program, and the OWOW Plan Update 2018, serve all people and communities in the watershed. The plan itself is developed by stakeholders drawn from across the diversity of communities and interests in the watershed. Gathered in workgroups called "Pillars," these stakeholders lead development of the goals and objectives of the plan, and then the recommended strategies for how to achieve those goals. The Pillars are the most important innovation of the OWOW Program and are the source of the OWOW Program's strength.

The OWOW Steering Committee, formed with the development of the original OWOW Plan, are the representative decision makers for the OWOW Program. Working under a delegated authority of the SAWPA Commission, the OWOW Steering Committee listens and reviews the various stakeholder interests, driving consensus where possible, seeking compromise when needed, allocating resources, and prioritizing strategies and projects for implementation.

The SAWPA Commission, constituted of one elected director from the five member agencies of SAWPA, is the approved Regional Water Management Group (RWMG) for the Santa Ana Funding Area, and therefore is ultimately responsible for the OWOW Plan Update 2018.



PRINCIPLES FOR WATERSHED PLANNING

Watershed planning is well established in the United States and around the world. The watershed has benefitted from

watershed planning since SAWPA was formed in the early 1970s. The OWOW Program follows these watershed planning principles:

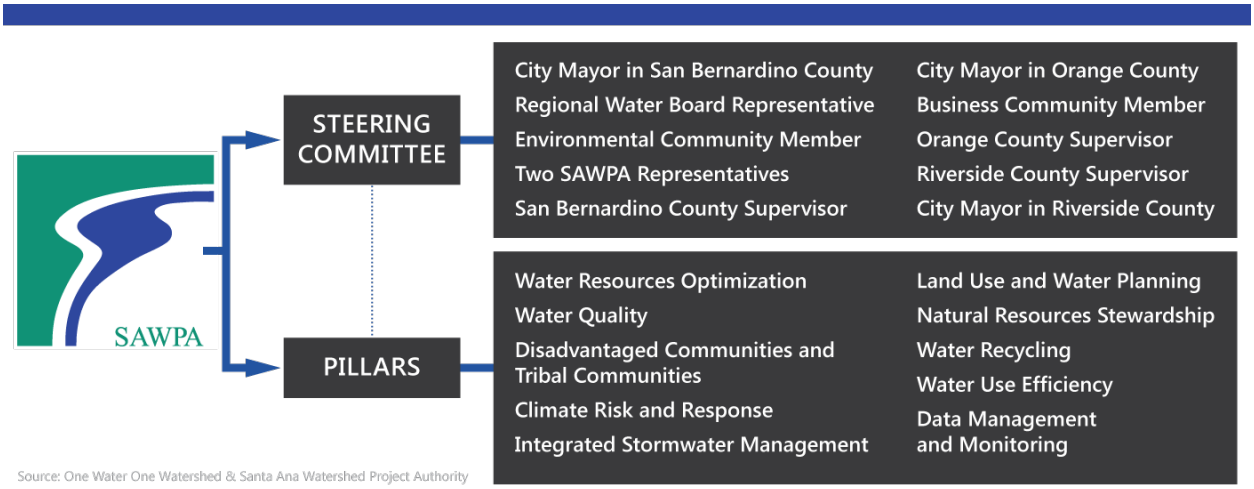
- Planning must be watershed-wide and bottom-up in order to allow for a holistic and systematic approach to watershed management.
- Involving stakeholders is fundamental, and must include those representing counties, cities, and water districts, as well as the private sector and the regulatory, environmental, and environmental justice communities. The active participation of a diversity of voices and interests ensures the integration of different interests in the watershed beyond political boundaries.
- Developing the plan must not be linked directly to any particular source of implementation funding. All opportunities, challenges, goals, and strategies must be considered in an integrated way to provide the most effective plan, and the most effective change in the watershed.
- Developing and implementing the plan must result in new agreements and partnerships, and no effort at improvement somewhere in the watershed can be at the unreasonable expense of another.
- Achieving sustainable water management that equitably balances competing interests to ensure long-term health and prosperity for society and nature is at the core of watershed planning.

OWOW PROGRAM GOVERNANCE

For the OWOW Program, the term "governance" describes the formal and informal collaborative decision-making that sits at the core of the bottom-up approach. Goals are set, strategies considered and recommended, and partnerships are built by those who step forward to participate in the program. In addition, explicit efforts which were initiated in the OWOW 2.0 Plan are continued in OWOW Plan Update 2018 to ensure that community expertise is sought from members of communities who have historically been underrepresented in integrated water management planning. Leadership and coordination of the OWOW Program occurs at several levels:

- The watershed community at large is involved through the 10 Pillar workgroups (called Pillars because together they carry the load of decision-making), representing different watershed issues. The Pillars identify issues, recommend solutions, and write the OWOW Plans.
- The OWOW Steering Committee is a representative decision-making body composed of elected officials and representatives from the Counties of Orange, Riverside, and San Bernardino; municipalities; water districts; the private sector; and the environmental and regulatory communities. The OWOW Steering Committee develops the goals and objectives of the OWOW Plans, makes strategic decisions, prioritizes project tasks, and issues recommendations.
- The SAWPA Commission has five members, each an elected leader from one of the member agencies of SAWPA. The SAWPA Commission provides final direction, review, and approval.

- SAWPA administration and staff facilitate the OWOW Program on behalf of all watershed stakeholders under the standards and authority of the California IRWM Program.



Source: One Water One Watershed & Santa Ana Watershed Project Authority

GOALS

The OWOW Plan Update 2018 has six goals, shown below. The goals are evolved from the earlier OWOW Plans. This evolution can be attributed to the changing understanding about the opportunities and challenges facing the watershed, as well as the lessons learned, and accomplishments achieved during implementation of the earlier plans.

The six goals of the OWOW Plan Update 2018 are to:

- Achieve resilient water resources through innovation and optimization.
- Ensure high-quality water for all people and the environment.
- Preserve and enhance recreational areas, open space, habitat, and natural hydrologic function.
- Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed.
- Educate and build trust between people and organizations.
- Improve data integration, tracking, and reporting to strengthen decision making.

PLANNING TARGETS

The OWOW Plan Update 2018 holds the vision as the target—that is, a sustainable watershed. Planning to achieve that vision comes from this entire document, focused on the six goals. By striving toward those goals, the watershed will move toward achievement of the vision. The vision is an "infinite game," in that the effort necessary to achieve and then remain within the vision can never end. Sustainability, as it is used in the OWOW Program, is not a destination, it is a process.

These goals will not be achieved by just building projects using general-obligation bond money. These goals reflect the broad view that the OWOW Program holds, and the systems thinking that

comes from the stakeholders and Steering Committee, all of which bring deep wells of individual expertise to the collaboration. Pooling these resources ensures that the planning targets and indicators of progress toward goals are equally broad, selected for their ease of measurement and clear meaning that can be understood by all participants.

For the OWOW Plan Update 2018, planning targets are drawn from an assessment tool developed in partnership with California Department of Water Resources. The tool uses two measurable indicators for each of the six goals. When completed annually, the tool will reflect progress towards the goals, helping all stakeholders and decision makers to revise management strategies when needed. In this way, the target is progress, which will be assessed annually.

RECOMMENDATIONS

Ten Pillar workgroups submitted Recommended Management Strategies and Policy Strategies, which are key to developing the correct suite of implementation efforts. There is only a fuzzy distinction between the two types of recommendations, and the workgroups were encouraged to consider first what strategies can be implemented by people, organizations, or agencies given current rules, technology, budgets, and authorities. These are the management strategies. Policy strategies, on the other hand, are those things that require the action of elected members of government, the development of new funding sources, or implementation of new technology. Again, the distinction between the two strategy types is loose, and often progress will require approaches that integrated both.

Below is a selection of recommendations from the Pillar chapters, selected to display the diversity of ideas and breadth of innovative thinking contributed by these workgroups:

WATER RESOURCE OPTIMIZATION PILLAR

Purchase MS4 credits.

The Municipal Separate Storm Sewer System (MS4) permit process is intended, among other things, to increase the amount of stormwater captured and recharged in the watershed. These permits require the owner to construct their project in such a way as to recharge stormwater on their site. However, in some cases it may be more ideal from a water management perspective to recharge the stormwater somewhere upstream. One way to introduce flexibility into this process would be to allow owners to purchase MS4 credits, which could be applied to recharge projects in other locations. There may also be an opportunity to allow these credits to be used throughout the watershed. For example, a project in Orange County could purchase credits that could be used for a project in the upper watershed.

RECYCLED WATER PILLAR

Facilitate recycled water exchange.

Nearly all wastewater treated above Prado Dam is currently discharged into the Santa Ana River. The lower watershed uses the effluent to recharge its groundwater basin and reduce the need for

imported water. In the proposed exchange, the upper watershed would continue to deliver treated wastewater to the lower watershed via the Santa Ana River instead of developing recycled water programs. The lower watershed would change the place of delivery for some of the water they plan to import to the upper watershed, which would replace the treated wastewater. Because recycled water is 100% reliable and imported water is about 60% reliable, storing imported water in the upper watershed (or other water bank) during wet years for use in dry years would mitigate the lower reliability of imported water.

DISADVANTAGED COMMUNITIES AND TRIBAL COMMUNITIES PILLAR

Manage plant palettes.

Long-term management plans should be developed, with input from California Native Americans, to increase the success of native plants and minimize health risks in the landscape. Incorporating traditional gathering and tending practices into management plans is becoming more common on both private and public lands. It is also important to recognize that native plants are very dependent on the correct water structure (amount, flow rate, and mineral content) being available at a specific location to help these plants and the communities that rely on them survive climate changes and different weather patterns.

Focus on critical infrastructure.

It is recommended that critical infrastructure, which supports a resilient water supply, effective sanitation, and sufficient flood protection, be prioritized in communities where it is deficient or threatened. Projects that achieve this recommendation should be prioritized for implementation and funding requests. In particular, the transition from insufficient septic to sanitary sewer is a high priority, as is the need to overcome localized flooding that impacts pedestrians. Small agencies require technical assistance and outside funding to support these transformations.

CLIMATE RISK AND RESILIENCE PILLAR

Address and mitigate public health risks.

Climate change will result in increased health risks through more extreme and persistent weather events, increased temperatures, and decreased water supply reliability. Members of disadvantaged communities, particularly individuals experiencing homelessness, are disproportionately at risk. Consideration and mitigation of public health risks, particularly for members of the most vulnerable communities, will be an important component of climate adaptation. It is recommended that efforts protect public health in the context of climate change by providing targeted education, developing programs that ensure the human right to water, and working with public health agencies to align programming and communication.

INTEGRATED STORMWATER MANAGEMENT PILLAR

Identify floodplains for habitat and infiltration.

Well-functioning floodplains provide habitat for a significant variety of plant and wildlife species and provides for natural reduction of flood flows. Flooding can recharge groundwater basins, improve water quality, and control erosion. Development in floodplains can permanently alter natural floodplain functions, destroy habitat of sensitive species, and reduce the beneficial connections between different types of habitat and adjacent floodway corridors. Identification of floodplains that are still in their natural state could directly preserve areas for open space, habitat, and natural hydraulic function.

LAND USE AND WATER PLANNING

Work with planning organizations and councils of government.

Collaborative effort should be undertaken to develop a checklist of land use planning tools that will increase groundwater recharge and that can be incorporated into local ordinances, an incentives-based program to encourage private property stormwater capture or hydrologic connectivity, and private property invasive weed management. Model ordinances and policies must be collaboratively developed related to complete streets, connectivity of trail systems and parks, tree planting and care, and early interaction with water agencies when making land-use decisions.

NATURAL RESOURCES STEWARDSHIP PILLAR

Provide sustainable funding for ongoing maintenance.

Over the past few decades, development interests, regulators, and environmental groups have worked together to encourage habitat conservation and enhancement while allowing for reasonable land development. Such efforts include natural community conservation plans and habitat conservation plans. These programs have provided large conservation areas to accommodate large developments but have taken years and large financial commitments to develop and implement. Sustainable funding sources for the maintenance of conservation areas can come from cooperative agreements between public landowners and organizations that conduct long-term stewardship of habitat and conservation areas.

WATER QUALITY PILLAR

Protect ocean water quality.

The primary emphasis with ocean water is maintaining water quality in order to protect marine resources and public health. Ocean water quality is evaluated using a number of different parameters and constituents related to beneficial uses. In the Regional Board's water quality control plan (Basin Plan), one of the key beneficial uses is REC-1 (full body contact recreation). In addition to recreation, the ocean waters also support important habitat areas, including two Areas of Special Biological Significance and their related onshore Critical Coastal Areas. Important coastal areas within the watershed include the Newport Beach Marine Life Refuge and the Irvine Coast Marine Life Refuge.

Implementing projects that manage urban wet- and dry-weather runoff throughout the watershed can benefit ocean water quality. Recommended are constructed wetlands, local urban runoff treatment systems, surface water diversions to publicly owned treatment works, source controls, and public education.

WATER USE EFFICIENCY PILLAR

Encourage implementation of advanced metering infrastructure.

Most customers in the Santa Ana River Watershed are metered, but there are still opportunities for advanced metering infrastructure (AMI) or automatic meter reading (AMR). Implementation of these technologies provides information that can detect leaks and help water agencies target water use efficiency programs. Frequent monitoring of use patterns allows water retailers to determine if customers are observing water use regulations. These include local day and time prohibitions as well as those rules imposed by the state, such as the prohibition against outdoor irrigation within 48 hours of measurable precipitation. In conjunction with the meters themselves, there is a growing market for customer portals, giving customers additional data about their own water use.

DATA MANAGEMENT AND MONITORING PILLAR

Develop a trust framework for data sharing.

The development of a regional trust framework is needed to establish trust between agencies as well as trust in the functionality of a regional data management system. Developing this agreed-on intent at the regional level will facilitate the establishment of a data management framework that can answer critical regional questions and inform water resource decision makers. Sharing of information and associated privacy considerations will be a critical policy consideration. Appropriate sharing of information will be key to extending this trust framework to individual water resource decision makers who participate as members of the public. The trust framework will also facilitate professional decision making and allow for a proactive, coordinated approach to compliance with state requirements.

WHAT'S INCLUDED IN THE OWOW PLAN UPDATE 2018

The OWOW Plan Update 2018 is available as PDF files that are available on the SAWPA website and elsewhere. The first PDF is the main body, consisting of nine chapters of material. The second PDF is the collected appendices.

The first chapter introduces the OWOW Program, the earlier OWOW Plans, and the watershed planning and management that preceded the OWOW Program—the Santa Ana River has benefitted from nearly 50 years of watershed planning.

Chapter 2 describes in depth the stakeholder processes, the governance model, and how the work of so many is integrated into the OWOW Plan Update 2018. The vision, goals, objectives, and planning targets, described briefly above, are the focus of Chapter 3, which also shares how the OWOW Program will assess its progress toward the goals.

Chapter 5 contains the deep work completed by the Pillar workgroups. Included are the nearly 200 recommended management and policy strategies that, once taken up throughout the watershed, will help achieve the goals of the OWOW Plan Update 2018.

The remaining chapters share additional information that contextualizes the earlier chapters. Chapter 6 describes the process developed during the OWOW Plan Update 2018 process to carry out calls for projects, and then to prioritize activities in the watershed. Chapter 7 contains more information about integrated and sustainable water management and how those practices can yield benefits and other rewards. Chapter 8 has been only slightly updated from the OWOW 2.0 Plan, as its material about the challenges and opportunities to finance this work is still relevant. Chapter 9 describes how the OWOW Program manages the data of the program and reveals a series of data management and analysis tools that have been developed by SAWPA and others that can benefit those implementing IRWM programs and projects.

A number of important appendices follow the main body of the OWOW Plan Update 2018. Deeper analyses of the water supply portfolio, the condition of water quality, and habitat are there. Also included is an updated climate change analysis produced by the U.S. Department of the Interior Bureau of Reclamation (Reclamation), working in partnership with SAWPA. This analysis supported spatial prioritization of climate vulnerabilities for the OWOW Plan Update 2018. Reclamation is a valuable partner in the watershed.

Another significant partnership resulted in one of the appendices. Working with Environmental Science Associates and the Bay Institute, contracted by the California Department of Water Resources (DWR) to support the California Water Plan Update 2018, SAWPA produced an updated watershed assessment tool. Building on the OWOW 2.0 Plan, this tool aligns with the Sustainability Outlook, a critical section of the California Water Plan Update 2018. SAWPA and the stakeholders of the OWOW Program appreciate DWR's commitment to supporting the OWOW Plan Update 2018.

CONCLUSION

Benefits resulting from the implementation of the OWOW Plan Update 2018, and from the planning process itself, will materialize at different time horizons and will have very different characteristics. While some specific projects will be operational within a couple of years, other more ambitious efforts, such as those requiring significant investment, technological development, or new mindsets and behaviors, could take years or decades to be fully realized. Similarly, some infrastructural projects will provide immediate tangible benefits, while education and engagement programs will result in benefits that are less easily measured, but no less significant.

The development, adoption, and future implementation of the OWOW Plan Update 2018 has yielded and will yield these benefits in the watershed:

- Adoption of a collaboratively developed vision, goals, objectives, and strategies for the watershed to achieve sustainable water management by 2040

- Prioritization of multi-benefit projects – projects that provide benefits to more than one user or subregion of the watershed and that address more than one opportunity or challenge
- Recognition that society, the environment, and the economy are inextricably interdependent, and pursuing improvements in one cannot result in harm or neglect of another
- Consideration of implementable projects and programs that will:
    - Increase the reliability of water supplies
    - Improve water quality
    - Enhance habitat and open space
    - Increase recreational opportunities
    - Prepare for climate impacts and reduce carbon emissions

The OWOW Plan Update 2018 is aligned with the earlier OWOW Plans and continues a legacy of stakeholder-led planning for the watershed. Compliant with the 2016 IRWM Plan Standards, the OWOW Plan Update 2018 will support progress toward sustainable water management through collaborative action, grant-funded implementation, and programs of research and education. Acting together to implement the OWOW Plan Update 2018 will support economic prosperity, social health and equity, and a thriving environment.

The OWOW Plan Update 2018 exists because of the tremendous amount of work that was contributed by the staff of many agencies, non-profit workers, students, consultants, and volunteers of all kinds. The process of crafting it is nearly as important as the OWOW Plan itself will be once it is implemented. Collaborative planning yields partnerships, builds trust, and creates the conditions for the success of sustainable water management and healthy watersheds. Resting on this strong foundation, the OWOW Plan Update 2018 joins its earlier versions as emblematic of collaborative watershed planning.

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OWOW STEERING COMMITTEE MEMORANDUM NO. 2019.6

DATE: January 24, 2019

TO: OWOW Steering Committee

SUBJECT: Disadvantaged Communities Involvement (DCI) Program – Update on Technical Assistance for Community Needs

PREPARED BY: Mike Antos, Senior Watershed Manager

RECOMMENDATION

It is recommended that the OWOW Steering Committee receive and file this presentation of the status of the Technical Assistance for Community Needs activity within the Disadvantaged Communities Involvement (DCI) Program.

DISCUSSION

Within the Disadvantaged Communities Involvement (DCI) Program is an activity called "Technical Assistance for Community Needs." This activity has a grant budget of about $2.9 million. The grant describes the activity this way:

> Activity 18 Technical Assistance for Community Needs
>
> During engagement efforts the program team will learn of projects, plans and programs. Following evaluation of these projects, plans and programs, an appropriate set will receive Technical Assistance (TA) including but not limited to project engineering services, curriculum development, translation services, and program support. The evaluation of the projects, plans, and programs will follow a set of evaluation criteria developed by DCI Technical Advisory Committee (TAC). This effort may also link to the State Board Technical Assistance Program, via the CSU DACC and Cal Rural Water Association which are both statewide TA providers.

The DCI TAC is made up of one person from each of the Program partners, as well as three agency representatives and the Disadvantaged Communities and Tribal Communities Pillar Chair (attachment 1). That group has met monthly for the past four months, developing an evaluation criterion and applying it to the list of projects, plans and programs that have been uncovered during the earlier engagement with members of disadvantaged communities. The work of finalizing the evaluation criteria is ongoing.

Four technical assistance (TA) efforts were approved by the DCI TAC for early-action, and SAWPA staff are beginning work to develop how these efforts will be carried out. They are listed below, with a brief description of each effort.

1. **Income Surveys**
   As was done previously in support of the Quail Valley effort by Eastern MWD, there is a need in portions of the watershed to carry out income surveys. These surveys have a standard protocol that once completed document the income status of a particular community, potentially revealing eligibility for funding designated for disadvantaged or economically distressed communities. Often in regions with rapid development, census data becomes "stale", and pockets of low-income communities fail to be visible in the standard community identification tools. Program partners California Rural Water Association and CSU Disadvantaged Community Center have expertise in conducting income surveys and, following SAWPA Commission approval, will be tasked to undertake this needed work.

2. **Big Bear Water Sustainability Project**
   A multi-benefit project is being developed in support of the year-round communities of Big Bear Valley, with aspects of water supply, recycling, beneficial use protection, and habitat improvement. The program will also provide benefits downstream in the San Bernardino Basin. Because this program is chiefly but not solely to the benefit of members of disadvantaged communities, it does not qualify for the waiver of the 6-month to CEQA completion within the Prop 1 Round 1 implementation grant program. The DCI TAC has approved providing financial support to the three involved agencies in their pursuit of CEQA completion so the project can be competitive within the grant program. Following further negotiation with the Big Bear agencies and, with SAWPA Commission approval, a subgrantee agreement will make financial resources available for use in the CEQA process.

3. **Tribal Working Group**
   The OWOW Plan Update 2018 contains recommended management and policy strategies related to Tribal communities in the watershed, crafted through the work of two Tribal Workshops held in 2017 and 2018. Chief among those recommendations is a Tribal Working Group, which would in-turn support the implementation of the other recommended strategies of that chapter. The Working Group is in-part described this way in the OWOW Plan Update 2018:

   > *It is recommended that SAWPA facilitate and fund a Tribal Working Group to ensure that Tribal consultation is occurring on all plans, strategies, and protocols being adopted within a watershed…Ideally, the Working Group would be a dynamic collaboration between numerous Tribal communities and SAWPA, as well as other stakeholders, to ensure cohesive understanding and shared responsibility.*

   Program partner California Rural Water Association has the expertise to support SAWPA in the development of this item and, following SAWPA Commission approval, will be tasked with leading this effort.

4. **Monitoring the water quality, aquatic and riparian habitat impact of homelessness above Prado Dam**
   Following the work completed to develop an understanding of the links between watershed management and homelessness earlier in the program, one issue raised was ensuring there is sufficient data and analysis to justify the expenditure of water agency resources on collaborative efforts to alleviate homelessness. This led to the distribution of a request-for-proposals that allowed SAWPA and its member agencies to retain a qualified consultant to develop two technical memoranda covering what is known about these relationships elsewhere in California, and what a monitoring program to ascertain these linkages in the Santa Ana River Watershed above Prado Dam would entail.
   The work of this consultant will be expensed to DCI Program, and the deliverables added to the grant deliverables, pending concurrence by the DCI TAC at their 18 January meeting, and approval from DWR for this activity to be within the grant eligible expenditures.

The next step for each of these efforts is for SAWPA staff to engage the groups who will conduct the work, develop the timeline, scope and budget, and seek SAWPA Commission actions to initiate the work.

Additional TA efforts will be uncovered, discussed and evaluated by the TAC, and brought forward through this same process for the remainder of the DCI Program grant.

Attachments:
1. DCI Program Technical Advisory Committee Roster

Disadvantaged Communities Involvement Program
Roster of the Technical Advisory Committee
January 2019

Name	Organization	Role
Holly Alpert	California Rural Water Association	Program Partner
Boykin Witherspoon	CSU Water Resources Policy Initiative	Program Partner
Valerie Olson	University of California, Irvine	Program Partner
Gary Pitzer	Water Education Foundation	Program Partner
Danielle Dolan	Local Government Commission	Program Partner
Beatrice Musacchia	Orange County Public Works	TAC member
Elizabeth Lovested	Eastern Municipal Water District	TAC member
Stuart McKibbin	Riverside County Flood Control District	TAC member
Megan Brousseau	Inland Empire Waterkeeper	Disadvantaged Communities and Tribal Communities Pillar Chair

OWOW STEERING COMMITTEE MEMORANDUM NO. 2019.5

DATE: January 24, 2019

TO: OWOW Steering Committee

SUBJECT: Orange County Stakeholders Letter

PREPARED BY: Mike Antos, Senior Watershed Manager

RECOMMENDATION

It is recommended that the OWOW Steering Committee receive and file this informational report from SAWPA staff and provide guidance as appropriate.

SUMMARY

Orange County stakeholders have requested the OWOW Steering Committee to divide and pre-allocate 38% of available Proposition 1 IRWM grant funds to projects in Orange County as selected by the OC Plan. They further requested that the OC Plan be included in the OWOW Plan Update 2018 as a chapter, rather than by reference in an appendix as are other subregional plans.

Orange County Public Works, on behalf of the signatories of the letter, has since filed a Regional Acceptance Process application (attachment 1) with Department of Water Resources, seeking to be a separate Regional Water Management Group. The application is pending.

Ongoing discussions among the agencies who are signatory to the letter, SAWPA staff, OWOW stakeholders, and representatives of other SAWPA member agencies have not, at the time of this memorandum, resolved the issues. A letter delivered to the OC agencies signed by Ron Sullivan as the OWOW Steering Committee Convener resulted in a meeting scheduled for January 22, 2019 (attachment 2).

DISCUSSION

The OWOW Program is designed to perform both the letter and the spirit of the California IRWM Program. The OWOW Plans comply with the most current IRWM Plan Standards, and the Plan is a tool for allocating grant resources when available through the program. But the OWOW Program and the OWOW Plans are much more than simply a tool for allocating implementation grant dollars.

The OWOW Program supports integrated planning at the scale of the Santa Ana River watershed, which is defined as a physical watershed but also by decades of practice, and the Santa Ana Regional Water Quality Control Board jurisdiction. Integrated planning here is partially driven by requirements of the California IRWM Program, but also by the history in this watershed of understanding the interdependence of those who rely on the river for water supply, groundwater recharge, recreation, critical habitat, etc. Consensus about the need for this type of planning in the watershed pre-dates the OWOW Program. Santa Ana River watershed stakeholders of past efforts, and in recent discussions, have affirmed that the watershed-scale work of the OWOW Program is

important, and that the watershed-scale planning and partnerships should not be diminished. These plans and partnerships are sought after by multiple statewide policy documents, including the California Water Action Plan, the California Water Plan Update 2013, and the 2017 DWR Stakeholders Perspectives report.

Including Sub-Regional Plans in the OWOW Plan Update 2018

The OWOW Program and the OWOW Plans acknowledge that watershed management occurs at multiple scales and is encouraged or required by multiple policy frameworks. In this, the OWOW Program considers two types of sub-regional plans. First are those that are water- or watershed-related and watershed-scale yet focused on a subset of issues contained within the OWOW Program. Examples are the Santa Ana River Parkway and Open Space Plan (California Coastal Conservancy, 2018), or the Santa Ana Basin Water Quality Control Plan (Santa Ana Regional Board, updated 2018). Second are those integrated or broad-based water- or watershed-related plans at a geographic scale within and smaller than the watershed. Examples include the Newport Bay Idea Book (Newport Bay Conservancy, 2015) or the Chino Basin Stormwater Resources Management Plan (Inland Empire Utilities Agency, 2016.)

When the OWOW Steering Committee acts to formally include sub-regional plans by reference in an appendix to the OWOW Plan Update 2018, it is a recognition of the efforts invested in those processes, and how success of those plans would in-turn provide progress towards the OWOW Plan goals (and likely vice-versa). But the OWOW Plan is not simply a sum of those other efforts. Rather, the OWOW Program prioritizes planning at the watershed scale because of the view, held by water leaders in the watershed for the last fifty years, that aspects of the watershed are interconnected in ways that are best managed through watershed-wide collaboration.

Role of Implementation Grants in the CA IRWM Program, and the OWOW Program

When the CA IRWM Program was created by the legislature and approved by the voters, it was explicitly designed to encourage regional collaborative planning because at the time this was rare. The implementation grants were included to incentivize the regional planning efforts. The OWOW Program has always recognized this incentive to develop and implement an integrated regional plan and has never focused the planning effort solely on implementing meritorious projects. In other words, more integrated planning is the goal of the OWOW Program, not simply the allocation of grant funds. Therefore, critiquing the geographic distribution of projects that have received grants is of dubious relevance to the overall program, while subdividing the region—even if into well run subregions—clearly defeats its purpose.

Because of the broad approach to include all stakeholders and the role of the OWOW Steering Committee as representative decision-makers, the OWOW Program considers watershed issues that reach well beyond what can be accomplished with the IRWM implementation grants. High-priority items like recreation, education, or the implications of homelessness; these are issues that come forward in the OWOW planning process that are less easily supported with general obligation water bond grants. This is by design. A valuable purpose of the OWOW Plan is to identify needs of the stakeholders and watershed leaders that will require different sorts of action, including and beyond what the IRWM grants can address.

Within the context of IRWM implementation grants, the need of the region outstrips the available grant resources. This is starkly clear in the ratio of available funds to needs identified by OWOW Plan project lists. For instance, in the three Prop 84 calls-for-projects, stakeholders in the region submitted about $1.95 billion dollars in grant requests for the available ~$115 million in grant funds allocated to the Funding Area. Alternatively, the OWOW Program funded projects from Prop 84 leveraged ~$650 million in local expenditures. This shows how OWOW planning is supporting local expenditures on integrated and regional projects – as is according to its design.

BACKGROUND

The SAWPA Commission is the state-approved Regional Water Management Group for the Santa Ana Funding Area of the California Integrated Regional Water Management Program. The One Water One Watershed Program is the Funding Area's planning effort within the California IRWM Program. The OWOW Program is itself an outgrowth of regional watershed planning that began early in the history of SAWPA. SAWPA was created in recognition of the interdependence of those who rely on the flow of the Santa Ana River.

In a delegated advisory role to the SAWPA Commission, the OWOW Steering Committee acts on behalf of the One Water One Watershed Program to govern stakeholder-driven planning and selection of programs and projects across the Santa Ana Funding Area.

The OWOW Program uses the name "Santa Ana River Watershed" to include other adjacent smaller watersheds which are administratively contained in the Funding Area. These adjacent smaller watersheds are today distinct because of flood control infrastructure and urban development, when in an historic sense they were components of a dynamic and flashy Santa Ana River system.

The Santa Ana River Watershed of the OWOW Program, the IRWM Funding Area, is nearly identical to the jurisdictional boundary of the Santa Ana Regional Water Quality Control Board (Santa Ana Regional Board). The Santa Ana Regional Board was constituted at that boundary because of the same hydrologic relationships as drove the creation of SAWPA, and the OWOW Program. The Santa Ana River Basin is the unit of regulatory authority, including "the upper and lower Santa Ana River watersheds, the San Jacinto River watershed, and several other smaller drainage areas."

ATTACHMENTS

1. Regional Acceptance Process application submitted to DWR by County of Orange.
2. December 21, 2018 letter send to OC agencies by Ron Sullivan on behalf of the OWOW Steering Committee

OC PublicWorks
Integrity, Accountability, Service, Trust
Shane L. Silsby, Director

November 20, 2018

Carmel Brown, P.E. Chief
Financial Assistance Branch
Division of Integrated Regional Water Management
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Dear Ms. Brown,

RE: Regional Acceptance Process Application for North Orange County

Please accept this Regional Acceptance Process Application for the proposed North Orange County Integrated Regional Water Management (IRWM) Region (Region). The Region includes all of Orange County not covered by the existing South Orange County IRWM Region. Following extensive coordination with North Orange County stakeholders, the County of Orange (County) submits this application as the lead agency for IRWM planning in the proposed Region on behalf of the Regional Water Management Group (RWMG), which consists of the County, the Orange County Water District (OCWD), and the Orange County Sanitation District (OCSD). The County is requesting DWR approval for a North Orange County IRWM Region within the Santa Ana Funding Area.

To address a desire from North Orange County stakeholders for a more focused planning approach, similar to that of the South Orange County IRWM Region, the County brought stakeholders together to update the North and Central Orange County IRWM plans. Through this process, regional priorities unique to the Orange County portion of the Santa Ana Funding Area of beach water quality, seawater intrusion control, marine protected areas, and ecological health of Upper Newport Bay and Anaheim Bay/Huntington Harbour were identified and prioritized.

The proposed Region has distinct geological and hydrological features with a natural boundary that provides for a functional and appropriate Region. The majority of the proposed Region drains directly to bays or the Pacific Ocean, and even the smaller Santa Ana River drainage is not hydrologically connected to the upper Santa Ana River watershed due to the physical separation of Prado Dam. Orange County is home to significant coastal and estuarine resources and recreational areas, which play a significant role in water resource management needs that are not shared with the upper Santa Ana River watershed region and have not been reflected in the Santa Ana Watershed Project Authority (SAWPA) One Water One Watershed (OWOW) Plan. Beach and estuary water quality are significant environmental, regulatory and economic drivers for the municipalities, water districts and local businesses of Orange County.

Water resource management within Orange County is highly integrated, reflective of the long-standing agency collaborations that pre-date the State's IRWM program. Water supply, water quality, flood risk, drought preparedness, wastewater treatment, recycled water, stormwater, and groundwater are cooperatively managed regionally within Orange County. These long-standing, integrated, regional water management efforts are best served by the creation of the proposed Region, and with prioritization of Orange County projects for grant funding determined through the local process created by stakeholders as described in *The OC Plan for IRWM in North and Central Orange County, March 2018.*

Over the past few years, Orange County agencies have raised concerns about the OWOW Program that implements the Plan and have made requests for program changes. These concerns involved the process used to select projects for grant funding, the governance structure, specifically in regard to conflict resolution, and a divergence in water resource priorities between the upper and lower watershed. While the RWMG continues to work with SAWPA to address these concerns and seek meaningful recognition of The OC Plan and its local prioritization process, at this stage of the discussions and with little progress made, the RWMG and local stakeholders believe the most benefit would come from approval of the proposed Region.

The RWMG and the region's stakeholders view the formation of the proposed Region as a means to increase participation in the IRWM program, to strengthen inter-agency collaboration, provide funding for projects prioritized within the proposed Region and establish a strong IRWM program that is not predominately structured and dependent on grant funding. The Region, if recognized, will continue to work with SAWPA to seek collaborative project opportunities that can be deployed watershed-wide.

I look forward to working with you as you review our request.

Sincerely,

Amanda Carr
Deputy Director, OC Environmental Resources
OC Public Works

November 20, 2018

Carmel Brown, P.E. Chief
Financial Assistance Branch
Division of Integrated Regional Water Management
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Dear Ms. Brown,

RE: Designation of Submitting Entity for Regional Acceptance Process Application for North Orange County

The Regional Water Management Group (RWMG), which consists of the County of Orange, the Orange County Water District (OCWD,) and the Orange County Sanitation District (OCSD), has selected the County to serve as the lead agency for IRWM planning in the proposed North Orange County IRWM Region. The County has been chosen for this role given their statutory authority over flood control, water resources, including stormwater and water quality, and its history of successful IRWM management in the South Orange County IRWM Region in the San Diego Funding Area. As such, the County will be submitting the Regional Acceptance Process application for the North Orange County IRWM Region on behalf of the RWMG.

Sincerely,

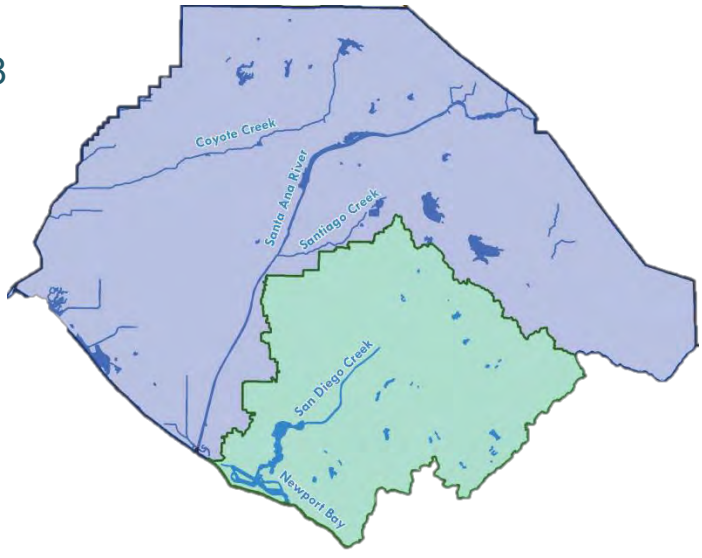
Amanda Carr
Deputy Director, OC Environmental Resources
OC Public Works

Michael R. Markus, P.E.
General Manager
Orange County Water District

Jim Herberg, P.E.
General Manager
Orange County Sanitation District

North Orange County IRWM Region
Region Acceptance Process Application

NOVEMBER 21 2018



Cover photos credit: courtesy of OC Parks

1 SUBMITTING ENTITY

The submitting entity for the Regional Acceptance Process (RAP) for the proposed North Orange County IRWM Region (Region) is the County of Orange (County). The Regional Water Management Group (RWMG) members include the County, the Orange County Water District (OCWD), and the Orange County Sanitation District. The RWMG requested that the County serve as the lead agency for IRWM planning given the County's statutory authority over water resources, including stormwater and water quality, and its history of IRWM management in South Orange County IRWM region within the San Diego Funding Area.

The RWMG designates Ms. Amanda Carr, Deputy Director of OC Environmental Resources for OC Public Works, as lead administrator for the Region. Ms. Carr has been authorized and directed by the RWMG to submit RAP materials and serve as the submitting entity contact for the Region.

Submitting Entity Contact:

Amanda Carr, Deputy Director
OC Environmental Resources, OC Public Works
2301 N. Glassell Street, Orange, CA 92865-2773
714-955-0601
Amanda.Carr@ocpw.ocgov.com

2 RWMG COMPOSITION

Evaluation Criteria:	*Document that the RWMG members have adopted the IRWM plan; that the RWMG consists of at least 3 agencies with at least 2 local agencies having statutory authority over water supply, water quality, water management, or flood protection; and there is diversity in the water management responsibilities of the RWMG members. Explain if there are entities not adequately represented by other RWMG members or stakeholders holding similar water management interests.*
Addressed Here:	o *The OC Plan, Section 1.3.2, page 1-11* o *The OC Plan, Section 2.5, page 2-65 to 2-70* o *The OC Plan Appendix A*

Entities not directly represented by the RWMG are disadvantaged communities (DACs), economically distressed areas (EDA), tribal members and non-governmental organizations. Engagement with DAC stakeholders has been a priority for Orange County since development of the first IRWM plans for the North and Central Watershed Management Areas (WMAs)[1] Since these plans were initiated, the County has worked to identify and include organizations

[1] The North and Central Watershed Management Areas (WMAs) were consolidated into the proposed North Orange County Region. All references to the North Orange County IRWM Region in this Regional Acceptance Process application includes both the North and Central WMAs.

representing DACs, such as Latino Health Access (as described in a subsequent section), in IRWM. Involvement in the IRWM program by DACs and tribal members is further being addressed through a countywide DAC Involvement Program. A DAC water needs assessment is currently being conducted for North Orange County in addition to the assessment being undertaken by the Santa Ana Watershed Project Authority (SAWPA) for the Santa Ana Funding Area and in conjunction with the assessment being undertaken by the San Diego Funding Area Tri-FACC. The goal of the water needs assessment is to better identify the needs of DACs within the Region and the applicable communities to inform project prioritization. The assessment includes outreach to agencies and organizations that serve DACs, which were identified through mapping. A water needs assessment questionnaire has been developed to facilitate identification of DAC water needs, and outreach workshops and presentations have been offered to agencies and organizations within the Region. A workshop to assist agencies across Orange County in completing the questionnaire was held on September 10, 2018.

Although not represented as a member of the RWMG, non-governmental organizations have participated in the development of *The OC Plan*. The function of the RWMG to date has been to secure funding and manage cost-sharing agreements to prepare *The OC Plan* and overseeing efforts to prepare the RAP application. The Stakeholders Group, supported by Ad Hoc Working Groups as necessary, was responsible for directing plan development, including determination of the Plan's goals, objectives, and strategies. This group is open to any interested party and includes non-governmental organizations, such as Orange County Coastkeeper.

3 STAKEHOLDER INCLUSIVENESS

Evaluation Criteria:	*Describe participation of a diverse range of stakeholders including DACs and tribes and other interests in water management and use; show that the IRWM region is inclusive and utilizes a collaborative, multi-stakeholder process that provides mechanisms to assist and involve DACs in addressing water management issues; explain how RWMG members and stakeholders have access to and exchange information on water management issues; and explain the processes and procedures in place for outreach to and to allow participation by those entities currently not participating.*
Addressed Here:	o *The OC Plan, section 1.3.1, page 1-9 to 1-11* o *The OC Plan, section 1.3.5 page 1-14* o *The OC Plan, section 1.3.7.2, page 1-15 to 1-17*

Additional stakeholder outreach efforts not described in *The OC Plan* include the following:

- OCWD *Hydrospectives* is an electronic newsletter sent to over 5,000 individuals who requested to be on the mailing list. OCWD has an active public engagement program where participants are invited to add their name to the list. Articles inviting participation in the development of the North Orange County IRWM program were included in the

issues for February 2017, March 2017, September 2017, November 2017, and January 2018.

- Women in Water is an informal networking organization of over 100 women professionals in Orange County who meet on a quarterly basis. At the February 2017 meeting, participants were invited to join in the effort to update the North Orange County IRWM plan.
- A presentation and invitation to join in the development of the North Orange County IRWM Program was made to the Water Advisory Committee of Orange County (WACO) at their monthly meeting held in March 2017. WACO facilitates the introduction, discussion, and debate of current and emerging water issues among Orange County policymakers and water professionals. The committee's membership of approximately 1,500 includes not only the elected officials and management staff from many Orange County water districts and cities, but also engineers, consultants and other professionals who work with the Orange County water community, was well as residents and community group members who share a common interest in water issues.
- The proposed Region and development of the OC Plan including the project prioritization process and solicitation of projects were discussed at:
    - OCWD Groundwater Producers Managers meetings February 9, 2017 and July 12, 2017. This group is comprised of the nineteen cities, municipal water districts, and water companies that are the major groundwater producers.
    - Newport Bay Watershed Executive Committee meetings held in December 2015, June 2016, October 2016, June 2017, September 2017, December 2017, and March 2018.
    - Newport Bay Management Committee meetings held in January 2017, February 2017, November 2017, February 2018, and August 2018.
    - A municipal stakeholder meeting on February 6, 2017 to engage municipalities in IRWM and invite participation in plan development.
    - Water Use Efficiency Workgroup meeting on February 1, 2018. This group is comprised of member agencies of the Municipal Water District of Orange County (MWDOC).
    - National Pollutant Discharge Elimination System (NPDES) Permittee committee meetings:
        - NPDES Technical Advisory Committee meeting on January 18, 2018. This is a public meeting of city engineer representatives from each of the five county supervisorial districts who are tasked with providing direction for the Orange County Stormwater Program.
        - NPDES Watershed Project Improvement Sub-committee meeting on January 24, 2018. This committee is comprised of city stormwater staff tasked with implementing the Orange County Stormwater Program in the North and Central Watershed Management Areas; the goal of the committee is to identify project opportunities that will assist in meeting NPDES permit compliance.

- NPDES General Permittee meeting on January 25, 2018. This committee is comprised of city stormwater staff tasked with implementing the Orange County Stormwater Program.

The County has developed data management system (DMS) websites for the North Orange County IRWM and the South OC IRWM programs. These DMS websites utilize Esri Story Maps to inform and engage stakeholders and the public by combining maps with narrative text and images in an easy-to-use format. The North IRWM DMS website includes comprehensive information on each project in North and Central Orange County to have received IRWM grant funding to date; a form for project proponents to use in submitting their projects for inclusion in the IRWM plan; a project data explorer mapping feature that facilitates stakeholder review of, and collaboration on, regional projects; information on public meetings, workshops, and other opportunities for stakeholder involvement; and, information on IRWM, *The OC Plan*, the Orange County Stormwater Resources Plan, and groundwater management in North Orange County.

County staff researched and developed best practices for involvement of DAC stakeholders, which included community presentations that were delivered in the appropriate and preferred language and encouraged participation in the IRWM process. Through those presentations, the County formed a partnership with Latino Health Access (LHA), a local nonprofit organization that works to help meet the health needs of the Latino community in the City of Santa Ana. As part of this partnership, the County provided assistance to LHA in developing a project for inclusion in the first North Orange County IRWM plan.

Recently, the County also partnered with the California State University, Fullerton (CSUF). CSUF is centrally located in the proposed Region and is surrounded by DAC communities in the cities of Fullerton and Placentia. As with LHA, the County provided in-kind services and assistance to CSUF in developing a multi-benefit landscape improvement project that would provide walking trails and open space to the community along with habitat restoration. As a result, CSUF was awarded non-IRWM grant funding from various state agencies for this project.

In 2011, the Department of Water Resources (DWR) prepared a map identifying Native American Tribal lands. Based on this map, the County understood that there were no tribal lands within the Region. However, the RWMG is continuing previous efforts to engage with DAC stakeholders through a water needs assessment currently being conducted for North Orange County in order to better identify the needs of DACs within the Region. This effort will include an investigation of tribal entities that may have previously been missed. Additionally, the information gleaned from the water needs assessment will be used to inform project prioritization in the Region.

4 PUBLIC INVOLVEMENT

Evaluation Criteria: *Describe the process for public participation in regular meetings including the method of making meeting agendas, notices and minutes accessible and how posting of meetings will provide sufficient time for the public to participate. Explain who the public should contact within the RWMG for questions regarding the IRWM program. Explain the process for the public to provide input to the RWMG and the process to be used by the RWMG to evaluate and respond to public input.*

Addressed Here:
- *The OC Plan, Figure 1-2 The OC Plan Governance, page 1-8*
- *The OC Plan, Section 1.3.2- 1.3.6, pages 1-11 to 1-14*
- *The OC Plan, Section 1.4 pages 1-22 to 1-23*

As referenced on page 4, the County DMS website gives access to view *The OC Plan* and contains a mapping tool to access the location and information on the projects that stakeholders submitted for inclusion in the plan. The public involvement section is used to post stakeholder meeting notices and agendas and other information concerning opportunities for public participation in the IRWM activities of the Region. Additionally, the County also posts this information on the County website at www.ocwatersheds.com.

Once approved as a Region, the RWMG will seek to broaden the governance in an effort to strengthen the public participation process. This will include public notice of all meetings of the RWMG (or alternate decision-making body if established, which could include a larger decision-making structure), in addition to the notices already posted for meetings of the Stakeholder Group. At a minimum, this will include:

- Posting of meeting notices and previous meeting minutes of the RWMG (or alternate decision-making body if established) at least one week prior to its meeting on the proposed Region website.

- Posting of meeting agendas at least 72 hours prior to a meeting of the RWMG (or alternate decision-making body if established) at the physical meeting location as well as the proposed Region website.

- Sending email announcements at least one week in advance of RWMG (or alternate decision-making body meetings if established) directly to stakeholders who have expressed interest in participation of all meeting notices and agendas.

- Establishing a regular schedule of quarterly or semi-annual RWMG (or alternate decision-making body if established) meetings that are posted on the website at least one month in advance.

- Providing time at meetings to allow the public to provide input to the RWMG (or alternate decision-making body if established) on IRWM Plan development and regional water management issues within the region.

Because the RWMG is still developing specific procedures for public participation, it is expected that the process will evolve based on continuous feedback from stakeholders and the public including those representing and from DACs and EDAs. Feedback received by the public during IRWM plan implementation will be captured in public meeting notes which will be reviewed by RWMG members and incorporated into the planning process and regional decision making.

5 GOVERNANCE

Evaluation Criteria: *Describe the decision-making process, including establishing goals and objectives, prioritizing projects, financing RWMG activities, implementing plan activities and making future revisions to the IRWM Plan. Explain who participates in the decision-making process, how this allows participation of stakeholders and smaller entities, and whether the governance structure allows only certain RWMG members to vote on decisions.*

Addressed Here:
- *The OC Plan, section 1.3, pages 1-7 to 1-14*
- *The OC Plan, section 1.4, page 1-22*
- *The OC Plan, section 3.2, pages 3-2 to 3-3*
- *The OC Plan, section 3.4 pages 3-16 to 3-19*

Governance for *The OC Plan* relies heavily on stakeholder involvement and input, both through the Stakeholder Group and the Ad Hoc Working Groups (*The OC Plan*, Figure 1-2). As such, all interested agencies, organizations, and individuals within the Region are welcome to participate and direct development and implementation of *The OC Plan*. Stakeholders shown in the table below were invited to participate in the Stakeholder Group, stakeholders in bold chose to participate in the Stakeholder Group

CA Department of Fish and Wildlife	City of Seal Beach	**Municipal Water District of Orange County (MWDOC)**
CalTrans, District 12	**City of Stanton**	Newport Bay Conservancy
City of Anaheim	**City of Tustin**	Newport Bay/Orange Coast River Park
City of Brea	City of Villa Park	OC Environmental Justice

City of Buena Park	**City of Westminster**	**OC Local Agency Formation Commission (OCLAFCO)**
City of Costa Mesa	Coastal Greenbelt Authority	**OC Mosquito and Vector Control District (OCMVCD)**
City of Cypress	**County of Orange / OC Public Works**	**OC Sanitation District (OCSD)**
City of Fountain Valley	**County of Orange / OC Flood**	**OC Water District (OCWD)**
City of Fullerton	**County of Orange / OC Parks**	**Orange County Coastkeeper**
City of Garden Grove	**County of Orange / OC Waste & Recycling**	**Orange County Farm Bureau**
City of Huntington Beach	Earth Resource Foundation	**Santa Ana River Watershed Project Authority (SAWPA)**
City of Irvine	**East Orange County Water District**	**Santa Margarita Water District (SMWD)**
City of La Habra	Friends of Coyote Hills	South Coast Water District
City of Lake Forest	Friends of Harbors, Beaches, and Parks	**South Orange County Wastewater Authority (SOCWA)**
City of Los Alamitos	**Hills for Everyone**	Southern CA Edison
City of Newport Beach	**Irvine Company**	**State of California Coastal Conservancy**
City of Orange	**Irvine Ranch Water District**	Water Replenishment District of Southern California
City of Placentia	Latino Health Access	**US Fish and Wildlife**
City of Santa Ana	**Mesa Water District**	

Once approved as a Region, the RWMG will seek to broaden the governance in an effort to strengthen the decision-making process. Specifically, this will entail the development of a public

meeting schedule of the RWMG (or alternate decision-making body if established); this body will approve decisions made by the Stakeholder Group through the process described below.

Evaluation Criteria:	*Explain if members must contribute financially to the RWMG to be allowed a voice and how the RWMG governance structure facilitates the sustained development of the IRWM region now and beyond the current IRWM funding programs.*

There is no financial commitment to participate at any level in the governance of the Region. *The OC Plan* was financed through local agencies contributions with cost-share agreements managed by the RWMG. The financial plan for the proposed Region will consist of voluntary cost-share agreements modeled after the agreements that the County uses to fund the South Orange County IRWM Region program. Management of the proposed Region will be coordinated with the management of the South Orange County IRWM Region.

Evaluation Criteria:	*Explain the conflict resolution process. Explain how the processes and procedures result in the promotion of integrated, multi-benefit, regional solutions that incorporate environmental stewardship toward development and implementation of the IRWM Plan. Explain how the RWMG will provide for a reasonable and effective governance structure for development and implementation of the IRWM Plan.*
Addressed Here:	o *The OC Plan, section 2.3, pages 2-43 to 2-45* o *The OC Plan, Section 5, pages 5-1 to 5-9*

Decisions in the Region, including the final selection of a portfolio of priority projects, will be made by consensus, as described in *The OC Plan*, by the Stakeholder Group. Conflicts that arise will be resolved in the following manner: If a conflict cannot be resolved, or a consensus not be achieved by the Stakeholder Group, the Group will convene an Ad Hoc Committee to meet, discuss and propose a resolution. The Ad Hoc Committee will report back to the Stakeholder Group of the proposed resolution. If further deliberation is needed to resolve a conflict the Advisory Committee will be requested to intervene and propose a resolution. Final direction on all issues related to IRWM in the Region will be presented to the RWMG (or alternate decision-making body if established) for approval.

Orange County has a long history of working collaboratively to successfully resolve conflicts, such as in the following two examples:

Compliance with Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA), passed by the California legislature in 2014, required all medium and high priority basins to either form a Groundwater Sustainability Agency (GSA), which would prepare a Groundwater Sustainability Plan (GSP) or submit an Alternative Plan that is functionally equivalent to a GSP. In addition to being functionally equivalent to a GSP, Alternative Plans had to cover the entire groundwater basin as defined by DWR in Bulletin 118. Since OCWD had been managing the groundwater basin sustainably for many decades, it elected to prepare and submit an Alternative Plan. OCWD's service area covers approximately 90 percent of DWR's Basin 8-1, the Coastal Plain of Orange County

Groundwater Basin. Some agencies outside of OCWD's service area elected to form a GSA. Working through this process resulted in an agreement with three counties, four cities in two counties, and four water districts to prepare the Alternative Plan, while at the same time agreeing to support the formation of a GSA in a portion of Basin 8-1. This effort is an example of the way agencies and jurisdictions work together to develop mutually beneficial solutions and resolve potential conflicts. Such efforts are a result of long-standing institutional collaborations that have been developed over time.

Fecal Coliform Stakeholder Process

In 2017, a stakeholder process was initiated to address bacterial water quality regulations in Newport Bay with respect to recreational Water Contact (REC-1) and Shellfish Harvesting (SHEL) beneficial uses. The process was part of legal settlement terms between the County /Orange County Flood Control District and Orange County Coastkeeper, and its objective was to engage in focused dialogue to develop and submit recommendations to the Santa Ana Regional Water Quality Control Board regarding the adoption of a revised Newport Bay Fecal Coliform Total Maximum Daily Load (TMDL) and/or alternative regulatory options/programs for the protection of the REC-1 and SHEL beneficial uses in Newport Bay. Stakeholder Group members included the County of Orange, Orange County Coastkeeper, City of Irvine, City of Newport Beach, Building Industry Association of Southern California, Newport Dunes Resort/Marina, The Irvine Company, Coastkeeper Alliance, Sierra Club, U.S. EPA, and Santa Ana Regional Water Quality Control Board. The Stakeholder Group met eleven times over the course of a year and a half to discuss a wide range of issues and review associated policy and technical analyses as they related to the protection of REC-1 and SHEL beneficial uses. This effort culminated in several recommendations from the Stakeholder Group to the Santa Ana Regional Water Quality Control Board and has encouraged a continuation of the Stakeholder meetings to further discuss the issues and coordinate implementation of the recommendations. The stakeholder process was aided by the participation of the Southern California Coastal Water Research Project (SCCWRP), a leading environmental research institute that works to develop a scientific foundation for informed water-quality management in Southern California.

6 REGION

Evaluation Criteria:	*Describe the rationale for determining the IRWM region boundary and how the region makes sense for long-term water management and considers multiple water management boundaries such as watersheds and groundwater basins. Explain how the IRWM region encompass the service areas of multiple local agencies. Explain how the IRWM region is structured to maximize opportunities to integrate water management activities related to natural and man-made water systems including water supply reliability, water quality, environmental stewardship and flood management; such that the water management portfolio in the region is strengthened and diversified*
Addressed Here:	o *The OC Plan, Section 2, pages 2-1 to 2-43* o *The OC Plan, Section 2.5, page 2-65 to 2-70*

The proposed Region has distinct geological and hydrological features with a natural boundary that provides for a functional and appropriate IRWM region. The majority of the proposed Region drains directly to bays or the Pacific Ocean, and the lower Santa Ana River drainage is not hydrologically connected to the upper Santa Ana River due to the physical separation of the Prado Dam.

7 WATER MANAGEMENT HISTORY

Evaluation Criteria:	*Discuss the history of IRWM efforts in the region including water management issues and water-related conflicts. Explain the appropriateness of the region's boundary in context of the region's unique water management issues. Explain how the stakeholders provide a balanced representation of the water issues in the region.*
Addressed Here:	o *The OC Plan, Section 1.1 page 1-4* o *The OC Plan, Section 1.2 page 1-5 to 1-7* o *The OC Plan, Section 2*.3 page 2-43 to 2-45

The multi-layered and long-established collaborative efforts between agencies, cities and organizations in the Region provide numerous platforms for resolving conflicts. The Newport Bay Executive Committee forges voluntary solutions for documented problems and provides a forum for the development of cost-sharing agreements to fund TMDL and address water quality impairments, including sediment, nutrients, fecal indicator bacteria, and toxicity. The agencies and organizations that utilize the groundwater basin meet monthly with the OCWD staff to provide input and work on groundwater management issues. The County of Orange has regular meetings with NPDES Permittees in both North and South Orange County through a committee structure designed to address various elements of the countywide stormwater program. These committees include the NPDES Technical Advisory Committee, General Permittee Committee, Trash and Debris Task Force, Local Implementation Plan / Program Effectiveness Assessment Sub-committee, Public Education Sub-committee, and Inspection Sub-committee.

8 INTER-REGIONAL COOPERATION

Evaluation Criteria:	*Explain overlaps, void areas or gaps within and outside of the region boundary.*
Addressed Here:	o *The OC Plan, Section 1.5 page 1-22 to 1-25* o *The OC Plan, Section 4.5.1 pages 4-27 to 4-28*

The proposed Region is bordered to the north by the Greater Los Angeles IRWM Region, to the south by the South Orange County IRWM Region, and to the east by the Santa Ana IRWM Region. There are no overlaps, gaps, excluded areas or void areas within or outside of the region boundary. The boundary for the Region does not leave any uncovered areas immediately

outside the boundary. With the formation of this proposed Region the intent is to continue to work with adjacent regions to seek future collaborative project opportunities.

Evaluation Criteria:	*Explain the inter-regional water management issues across adjacent IRWM regions. Describe how the Region addresses inter-regional water management issues and coordinate on interrelated water management activities. Based on the justification for the region boundary, the water management issues, and coordination with adjacent areas, describe how the proposed region represent the largest defined contiguous geographic area that maximizes opportunities to integrate water management activities related to natural and man-made systems.*

Greater Los Angeles IRWM Region

The inter-regional water management issues related to the LA Region include seawater intrusion and groundwater basin monitoring, and cooperative efforts in the Coyote Creek Watershed. The Alamitos seawater intrusion barrier spanning the Los Angeles/Orange County line is jointly owned by the Los Angeles County Flood Control District (LACFCD) and OCWD. LACFCD operates and maintains the barrier while the Water Replenishment District (WRD) of Southern California and OCWD purchase and provide the injection water supply. The monitoring and injection wells are maintained and sampled by LACFCD. Costs for barrier operations are shared by LACFCD and OCWD. A Joint Management Committee overseeing day-to-day operations is comprised of staff representing LACFCD, Long Beach Water Department, WRD, OCWD, and Golden State Water Company.

Inter-regional collaboration with the Greater Los Angeles County (GLAC) IRWM Region has also historically included involvement in the Coyote Creek Watershed Management Plan (CC WMP), a joint effort with the County of Los Angeles, cities along the Los Angeles/Orange County border, Rivers and Mountains Conservancy (RMC), and U.S. Army Corps of Engineers (ACOE). The County was the lead for this effort and hosted meetings throughout the watershed to facilitate the development of the CC WMP.

Other related interregional efforts include compliance with the Metals TMDL imposed by the Los Angeles Regional Water Quality Control Board. The County and Orange County watershed cities have participated with cities and agencies that drain to Coyote Creek to work together to develop a source control plan and are assessing watershed scale best management practices.

Another example of inter-regional water management relates to groundwater flow out of the Orange County Groundwater Basin into the Central Basin in Los Angeles County that is managed by WRD. Due to a lack of a hydrologic barrier, groundwater freely flows through aquifers across the county line. OCWD factors in this rate of flow out of the Basin in establishing the Basin water budget and in making Basin management decisions. OCWD and WRD staff meet on a regular basis to coordinate operations to reduce conflicts as management decisions are made by the two independent agencies.

South Orange County IRWM Region

The southern border of the proposed Region is shared with the South Orange County IRWM Region. These two regions regularly collaborate on several aspects of water management. For example, the County is the Principal Permittee for both NPDES permits issued by the Santa Ana and San Diego Regional Water Quality Control Boards for stormwater management within Orange County. Although the two NPDES permits contain differing permit requirements, the County manages both in a coordinated fashion.

The County also serves as the administrator for the South Orange County IRWM Region. The South Orange County IRWM Region is a diverse group that has been working together since 2004 to coordinate watershed planning activities and projects related to water management and watershed protection. For more information about the South IRWM Group and projects implemented to meet water resource goals in South Orange County, visit the South OC IRWM DMS website.

Stakeholders in the proposed Region pursue opportunities to collaborate with stakeholders in the South Orange County IRWM Region. An example of this ongoing collaboration is the Baker Water Treatment Plant (Baker WTP) project. The Baker WTP is located within the proposed Region but benefits cities and water districts in the South Orange County IRWM Region. The Baker WTP is a multi-benefit project that improves potable water supply and water reliability for southern Orange County, which has fewer opportunities to generate local water supply. Several South Orange County water agencies partnered with Irvine Ranch Water District that is in the proposed Region to bolster local potable water supplies in the event of emergency conditions. Partnership opportunities like these continue to be pursued, and establishment of the proposed Region would strengthen these efforts.

Another water supply collaboration example stems from North Orange County having the Orange County Groundwater Basin for approximately 80% of its drinking water supply while . South Orange County is highly dependent on imported water as this region is outside of the groundwater basin service area. However, infrastructure and interagency agreements provide for South Orange County to receive groundwater under emergency conditions.

The North IRWM DMS website includes a project data explorer mapping feature that is intended to facilitate stakeholder review of, and collaboration on, regional projects with adjacent regions.

Water use efficiency and water conservation programs are coordinated countywide by the Municipal Water District of Orange County (MWDOC). MWDOC is a Metropolitan Water District of Southern California member agency and as such purchases imported water supplies for cities and water districts in the county. The County also coordinates with MWDOC on stormwater messaging, such as the Overwatering is Out campaign which encourages residents to adopt behaviors that will prevent urban runoff from leaving their properties.

The Orange County Flood Control District (OCFCD) works to protect Orange County from the threat of floods by designing and constructing flood control facilities. As the single County agency responsible for managing the flood control infrastructure, OCFCD facilitates coordination between the two adjacent regions in Orange County.

Santa Ana IRWM Region

The adjacent region to the east of Orange County is the remainder of the Santa Ana Funding Area, which is comprised of portions of the counties of San Bernardino and Riverside, and which is managed by SAWPA through the One Water One Watershed (OWOW) Plan. SAWPA is a joint powers authority formed by five large water agencies to coordinate programs with a mission to plan and build facilities to protect the water quality of the Santa Ana River watershed. Orange County agencies participate in many SAWPA-facilitated collaborative programs through work groups and task forces facilitated and managed by SAWPA that operate independently from the Santa Ana Region's IRWM program (OWOW). These include the Basin Monitoring Program Task Force, the Imported Water Work Group, the Emerging Constituents Work Group, and the Regional Monitoring Program. The Santa Ana River is an important resource for Orange County as it provides approximately one-quarter of the supply for groundwater recharge. The creation of the proposed Region within the Santa Ana Funding Area will not impact the on-going work of these various work groups and task forces in the watershed.

The RWMG and the region's stakeholders view the formation of the proposed Region as a means to increase participation in IRWM planning, foster greater inter-agency collaborations, provide funding for projects important to Orange County that do not compete within the larger region's priorities, reduce conflicts between the upper watershed and lower watershed agencies in the Santa Ana River watershed, and establish a strong IRWM program that is not predominately structured and dependent on grant funding.

STATE CAPITOL
SACRAMENTO, CA 95814
(916) 651-4029

California State Senate

SENATOR
LING LING CHANG
TWENTY-NINTH SENATE DISTRICT

November 19, 2018

Carmel Brown, P.E., Chief
Financial Assistance Branch
Division of Integrated Regional Water Management
Department of Water Resources
1416 Ninth Street, P.O. Box 94836
Sacramento, CA 94236-0001

Re: Support for a North Orange County Region in the California Integrated Regional Water Management Program

Dear Ms. Brown:

I am pleased to support the formation of a new Integrated Regional Water Management (IRWM) region for north Orange County.

While north Orange County has participated in the IRWM program as a part of the Santa Ana River Watershed region, Orange County has unique water resource priorities and challenges that are distinct from the watershed. We understand that the new region will focus on water management issues of concern to Orange County, such as beach water quality, groundwater quality, stormwater management, and coastal resource protection.

I believe that a new North Orange County Region will improve integrated regional water management, increase stakeholder involvement in the IRWM program, and build on existing interagency collaboration and cooperation that has been a foundation of water resource management in the county.

Thank you for your consideration of this matter. If you have any questions, please contact my office at (714) 671-9474

Sincerely,

Senator Ling Ling Chang
California's 29th Senate District

SAWPA

Santa Ana Watershed Project Authority

OVER 45 YEARS OF INNOVATION, VISION, AND WATERSHED LEADERSHIP

One Water One Watershed
AWRA INTEGRATED WATER RESOURCES MANAGEMENT AWARD
HARVARD KENNEDY SCHOOL'S TOP 25 INNOVATIONS IN AMERICAN GOVERNMENT

Via – Electronic Email

December 21, 2018

Amanda Carr, Deputy Director
Orange County Public Works
Amanda.Carr@ocpw.ocgov.com

Jim Herberg, General Manager
Orange County Sanitation District
jherberg@ocsd.com

Mike Markus, General Manager
Orange County Water District
mmarkus@ocwd.com

RE: OWOW Steering Committee Response to Orange County

Dear Ms. Carr, Mr. Markus, and Mr. Herberg:

Thank you for your July 13, 2018, letter regarding the OWOW Plan 2018 Update and the Proposition 1 application process from the Santa Ana River Watershed Funding Area. As you know, your letter has been discussed at several public meetings, including the OWOW Steering Committee and the SAWPA Commission, as well as a meeting in Orange County with stakeholders, and you have presented information at those meetings and participated in the discussions.

Your letter asked that:

- The OWOW process be modified to pre-allocate 38% of the Proposition 1 IWRM grant funds to Orange County projects without presenting the list of projects nor project details;
- The Orange County Plan be incorporated into the OWOW Plan Update 2018 as a separate chapter; and
- That Orange County projects seeking Proposition 1 IRWM implementation grants be rated/ranked using the system developed in the Orange County Plan.

Further, during your presentation you indicated if the three items asked for were not granted, Orange County would apply with the California Department of Water Resources (DWR) to become a separate regional water management group (RWMG). You have notified us that an application to be a separate RWMG has been submitted to DWR. SAWPA has requested a copy of the application, but has not yet received it, and therefore renews that request.

The Steering Committee heard your presentation on September 27, 2018, and understands the concerns expressed on behalf of Orange County stakeholders, principally that it is felt Orange County does not receive a sufficient amount of IRWM implementation grant funding, suggesting that 38% would be the correct allocation. It was asserted that the OWOW rating and ranking system disadvantages Orange County projects due to their location at the bottom/lower portion of the

watershed, which may result in less watershed-wide quantifiable benefits than a project located in the upper watershed.

The Steering Committee has been open to ideas to address this perceived disadvantage and to address Orange County's concern that it receive a baseline level of available funding. These have included the following:

- Significant changes have been made to the project ranking system in response to your letter and previous Orange County comments in order to ensure that the RWM benefits of coastal projects are being fully defined, accounted for and weighed appropriately in project selection;

- Program changes have been incorporated at Orange County's request such as eligibility criterion that would prevent the program from supporting a project in one area of the watershed that would achieve benefits "at the expense or detriment of another;"

- An additional policy change is proposed to explicitly clarify that a project bringing benefits to anywhere in the watershed benefits the entire watershed. This is in direct response to the concern that small coastal drainages, Newport Bay watershed, and coastal-focused projects would be uncompetitive if "watershed-wide benefit" remained measured by the flow of water;

- Inclusion in this cycle of IRWM funding of a separate evaluation of projects, of which Orange County may also participate, for projects seeking grants under $500,000. This portion of the funding would incorporate the program and policy changes referenced above and allow additional competitive opportunities for 10% of the available grants; and

- The OWOW Plan Update 2018 will include an expanded description of the OC Plan, and the OC Plan will be adopted in by the OWOW Steering Committee alongside the other similarly adopted plans, referenced by appendix.

Finally, in light of Orange County's position, the Steering Committee has discussed and is willing to consider a target minimum grant funding amount of 25% for each of the three Counties If adopted, this system would still allocate the grant funds based on the quality and timing of the projects submitted as evaluated by the OWOW rating/ranking system (including the amended project ranking and policy changes to address Orange County's concerns), but would ensure that each County would receive a 25% minimum.

The OWOW Steering Committee and other stakeholders have made substantial concessions and are willing to consider additional measures, including the 25% minimum funding level for each County, to address Orange County's concerns. The OWOW Steering Committee has more representatives from Orange County than any other part of the watershed (five of 11 members), and there is certainly a disposition to address your concerns.

Our goal is to have an Integrated Regional Watershed Management plan and projects funded and implemented under that plan that accomplish exactly what the statute envisions - watershed-wide resource management. Your unwillingness to consider the numerous concessions already put into place to address Orange County's issues or to explore any further compromises such as the 25% minimum funding proposal is discouraging and disappointing. Nonetheless, the Steering Committee recognizes Orange County's right to apply to become a regional management group. Although, as you know, this does not guarantee that Orange County will receive 38% of the IRWM funding which you have claimed to be a minimum requirement.

Alternatively, and in a manner consistent with the goals of IRWM, we support and encourage continuing to work together to resolve this issue and maintain one regional management group for the benefit of the entire watershed.

Sincerely,

Ronald W. Sullivan
OWOW Steering Committee Convener

e-copy: Carmel Brown, P.E., Chief
Financial Assistance Branch
Division of Integrated Regional Water Management
Carmel.Brown@water.ca.gov

OWOW Steering Committee Members

Richard E. Haller, General Manager, SAWPA