



**JULY 23-27, 2017**

**11TH IWA INTERNATIONAL CONFERENCE  
ON WATER RECLAMATION AND REUSE**

**LONG BEACH, CALIFORNIA**



IN PARTNERSHIP WITH:



# CALIFORNIA RECYCLED WATER USE IN 2015

**Toni Pezzetti, PG, CHG**

Department of Water Resources  
Engineering Geologist

[Tonianne.Pezzetti@water.ca.gov](mailto:Tonianne.Pezzetti@water.ca.gov)



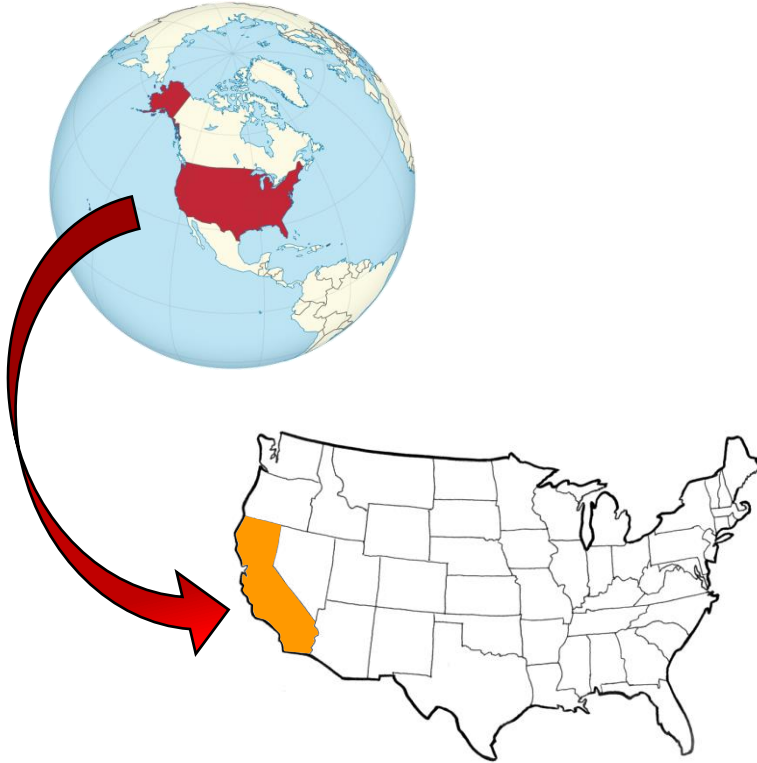
**David Balgobin, PE**

State Water Resources Control Board  
Senior Engineer

[David.Balgobin@waterboards.ca.gov](mailto:David.Balgobin@waterboards.ca.gov)



# Survey Overview



- 2015 calendar year
- Domestic waste from a municipal wastewater plant
- Planned and permitted reuse
- Title 22 allowable use
- Does not include internal reuse
- Does not have to replace a potable use
- Wetland and instream flow permit requirements

# Conducting a Statewide Recycled Water Survey has its Challenges

- No standard reporting method to the regional boards
- Finding the right person who has the data
- Misunderstanding of the term “recycled water” or beneficial uses
- Implementation of recycled water projects varies from location to location



# Primary Data Sources

2016 Recycled Water Survey

Instructions for the 2016 Water Recycling Survey

This is a mandatory survey that must be completed by close of business 8/31/16

The 2016 Water Recycling Survey is collecting data for the 2015 calendar year.

Please complete one survey for each facility that produces recycled water and/or is a RWI wholesaler or retailer.

[Please click here \(PDF\) for a list of facility names and the associated WQID.](#)

[Please click here \(PDF\) for guidance in filling out this survey.](#)

If your WQID is on the PDF list above, start here.

If you have a WQID or Survey Identification number, start here.

WQID Number or Survey Identification Number  Login

WQID does not match existing record.

Please refer to the list of facility names above, or create a new record below.

If you do not have a WQID number or Survey Identification Number, start here.

All of these fields are required:

First Name  Last Name

Phone  Email

Legal facility name  Agency names

Wholesaler without permit ☐

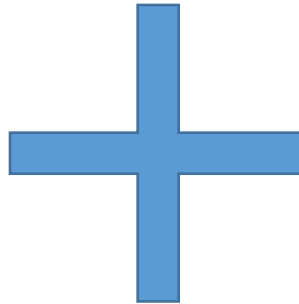
Continue

Please note, after entering the information above, a unique Survey Identification number will be created for use in updating the Recycled Water information you provide.

Inflow Outflow

This Survey Focuses on a facility

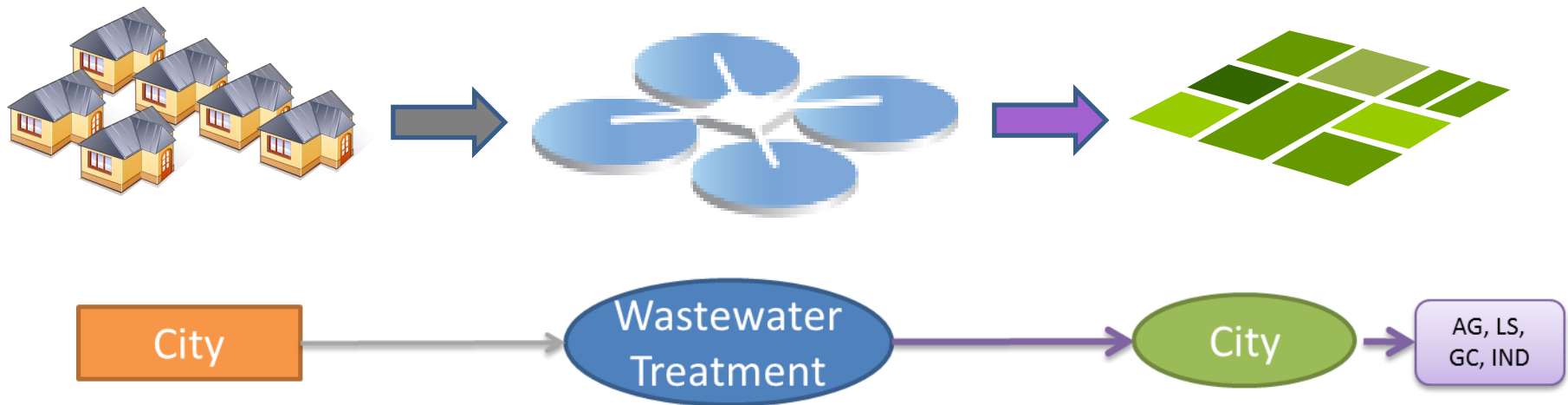
Online Survey to ~250 CA wastewater plants reusing treated wastewater



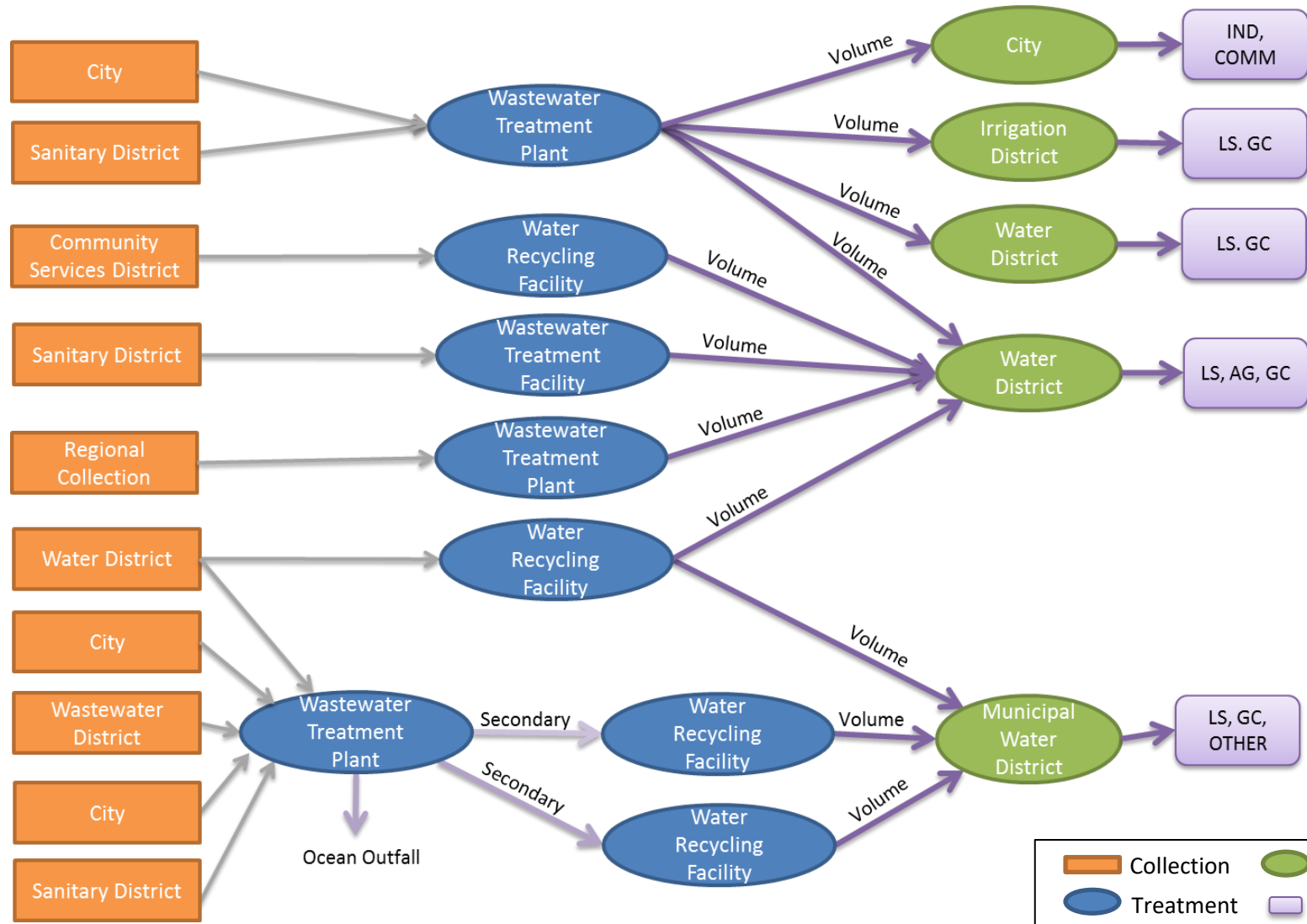
Urban Water Management Plans from ~400 CA water suppliers

## BOTH WERE CRITICAL

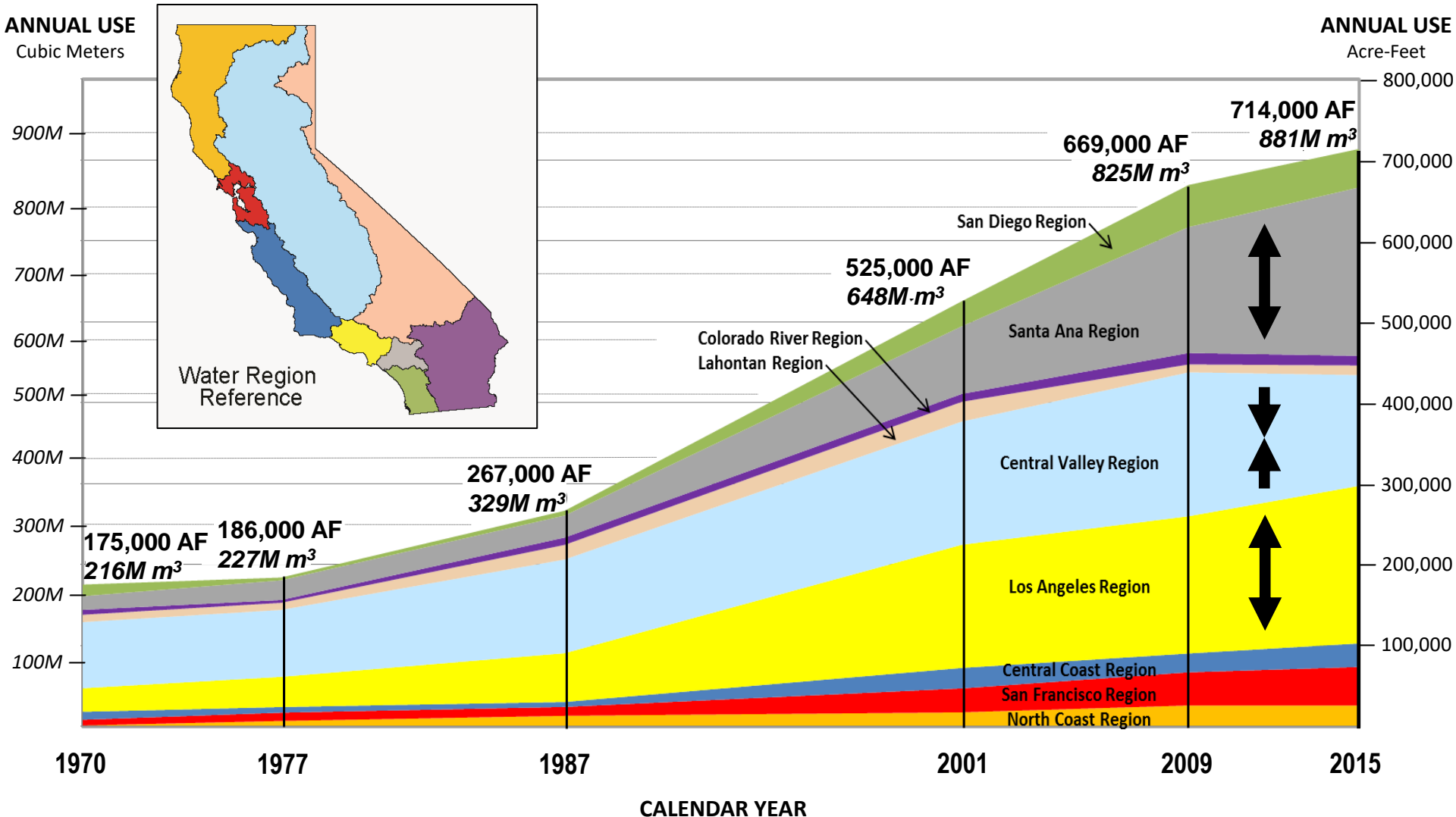
# California Recycled Water Production and Distribution



# California Recycled Water Production and Distribution



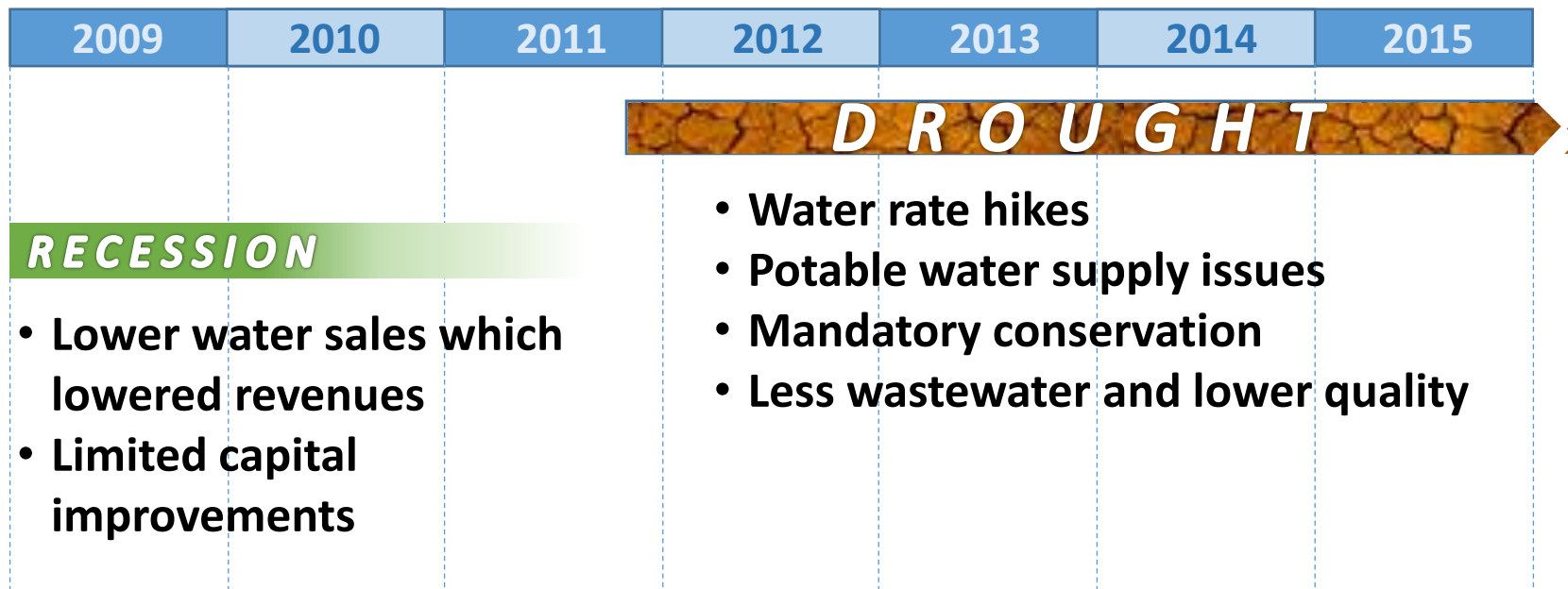
# CA Recycled Water Use Since 1970





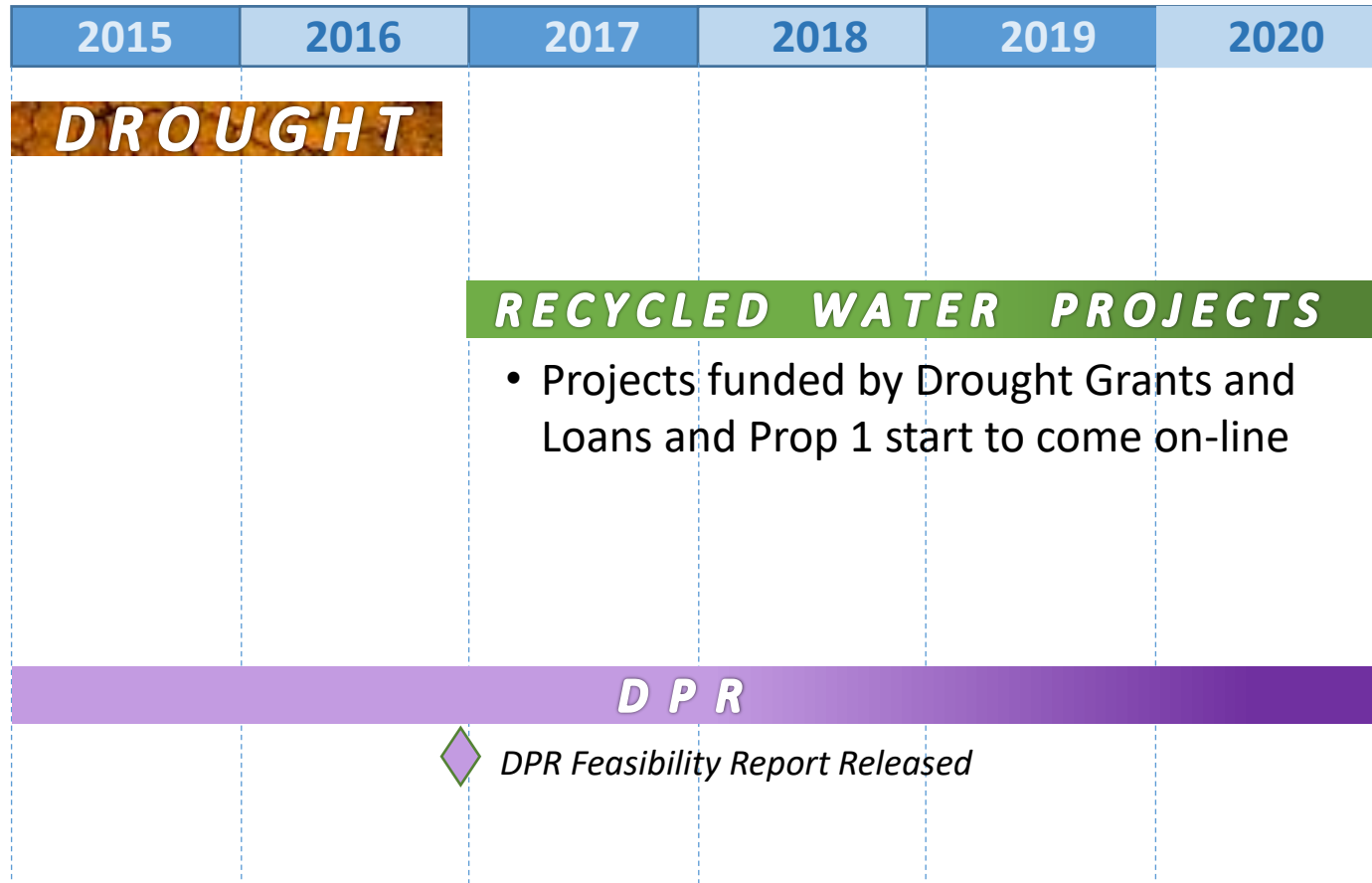
# Why Was the Total Increase Lower than Expected?

## *Negative External Factors*

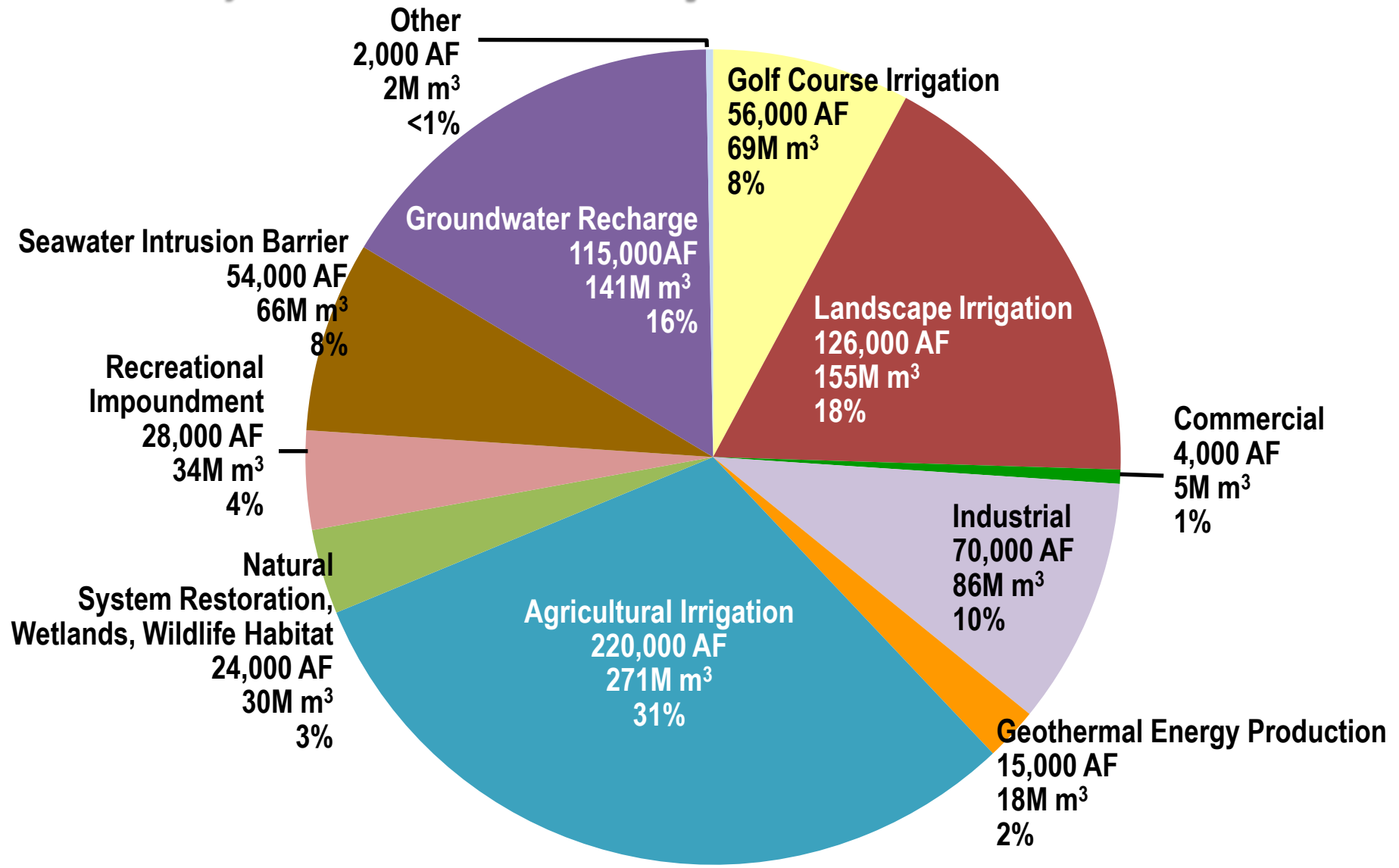




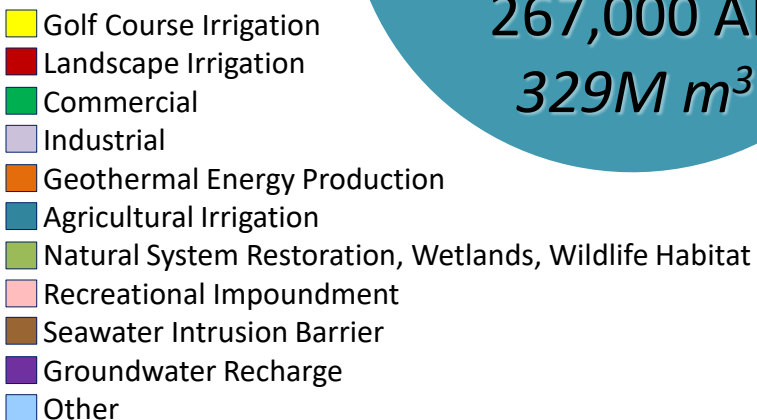
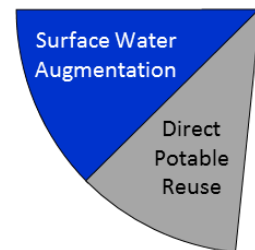
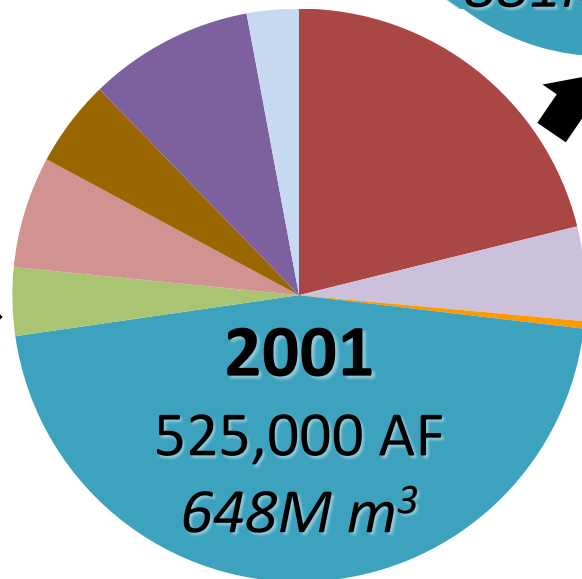
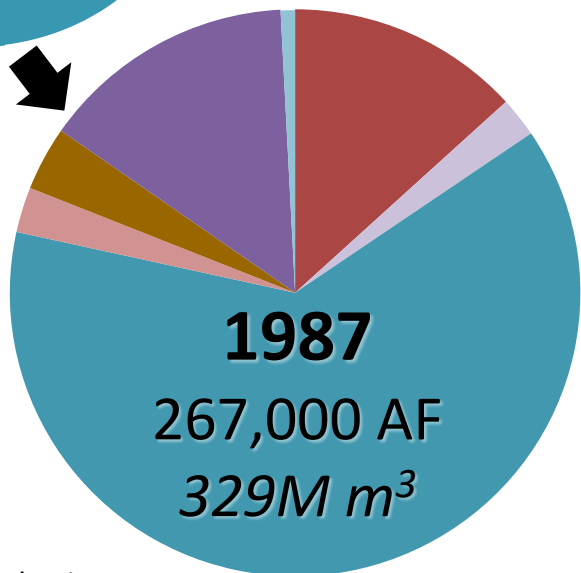
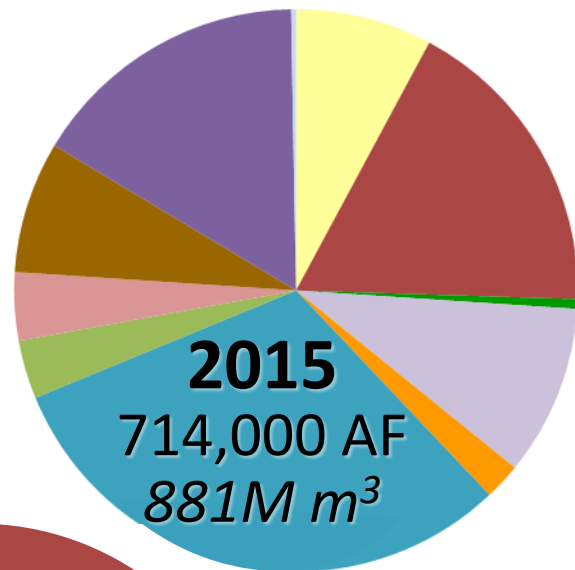
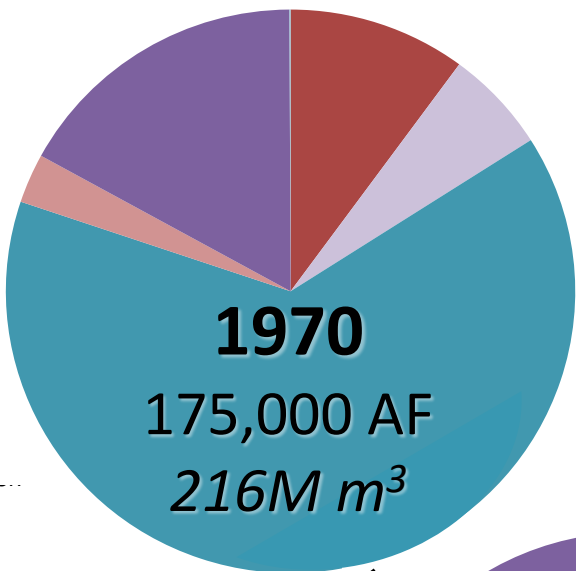
# The Future is Positive



# 2015 Recycled Water Use: 714,000 acre-feet/881M cubic meters

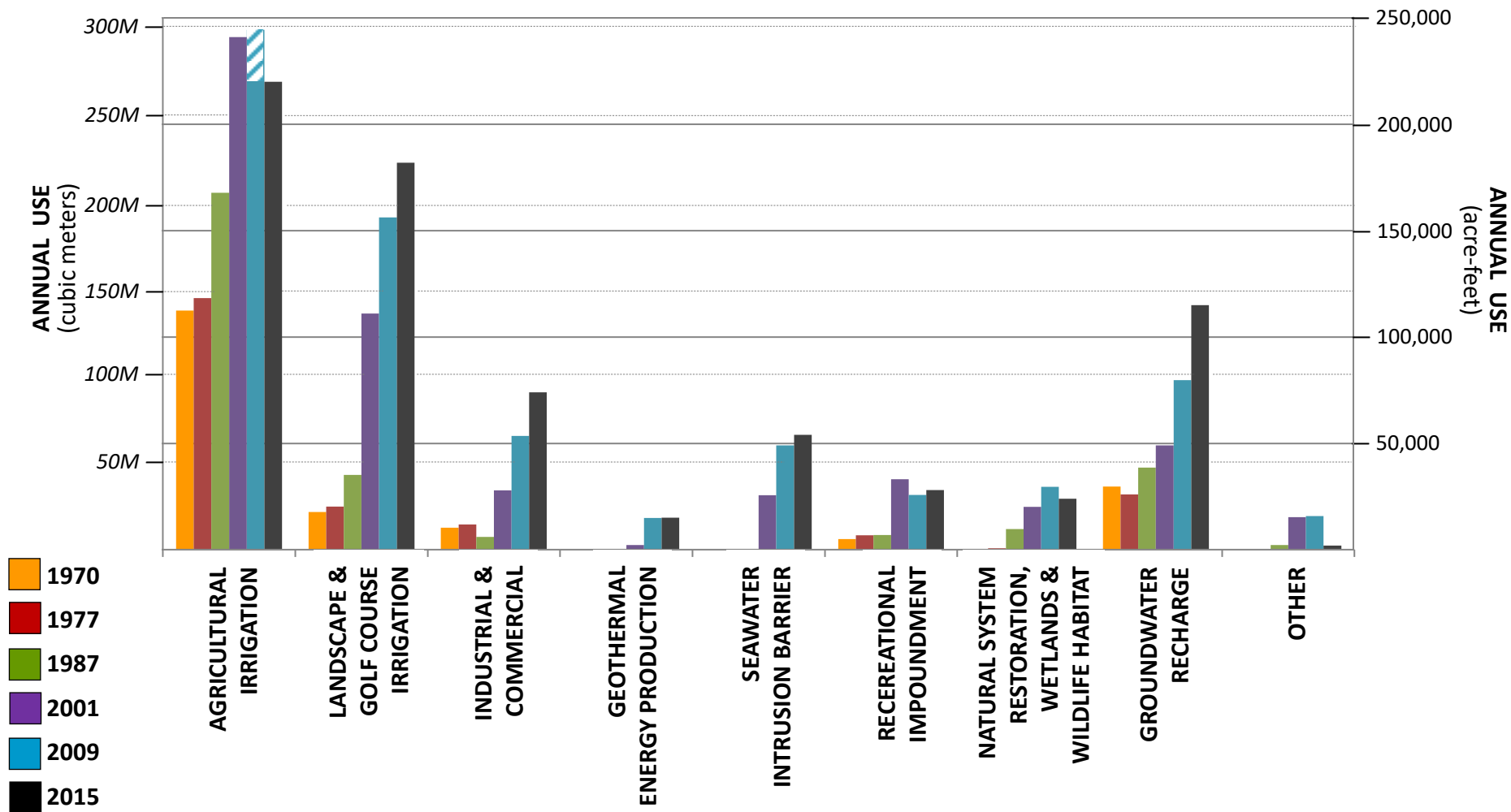


# Changes in California's Recycled Water Use

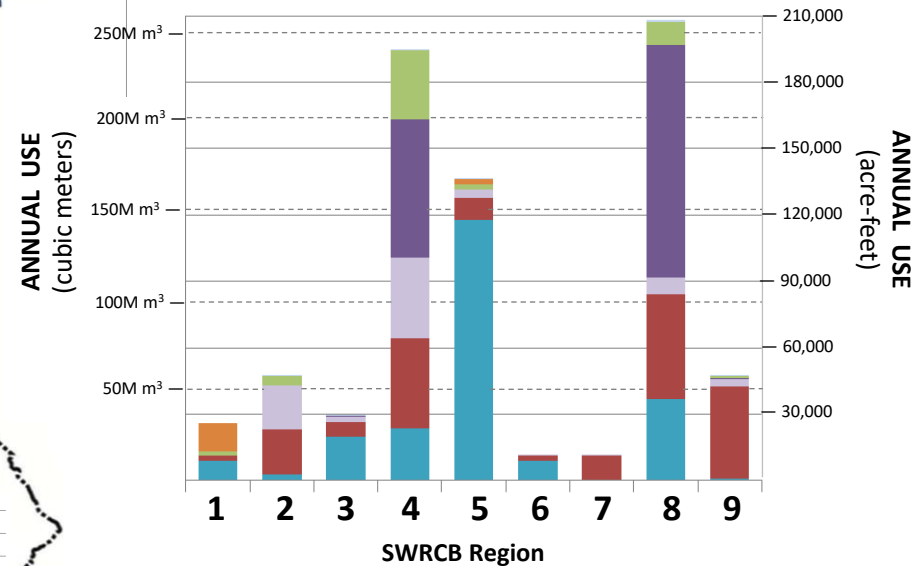
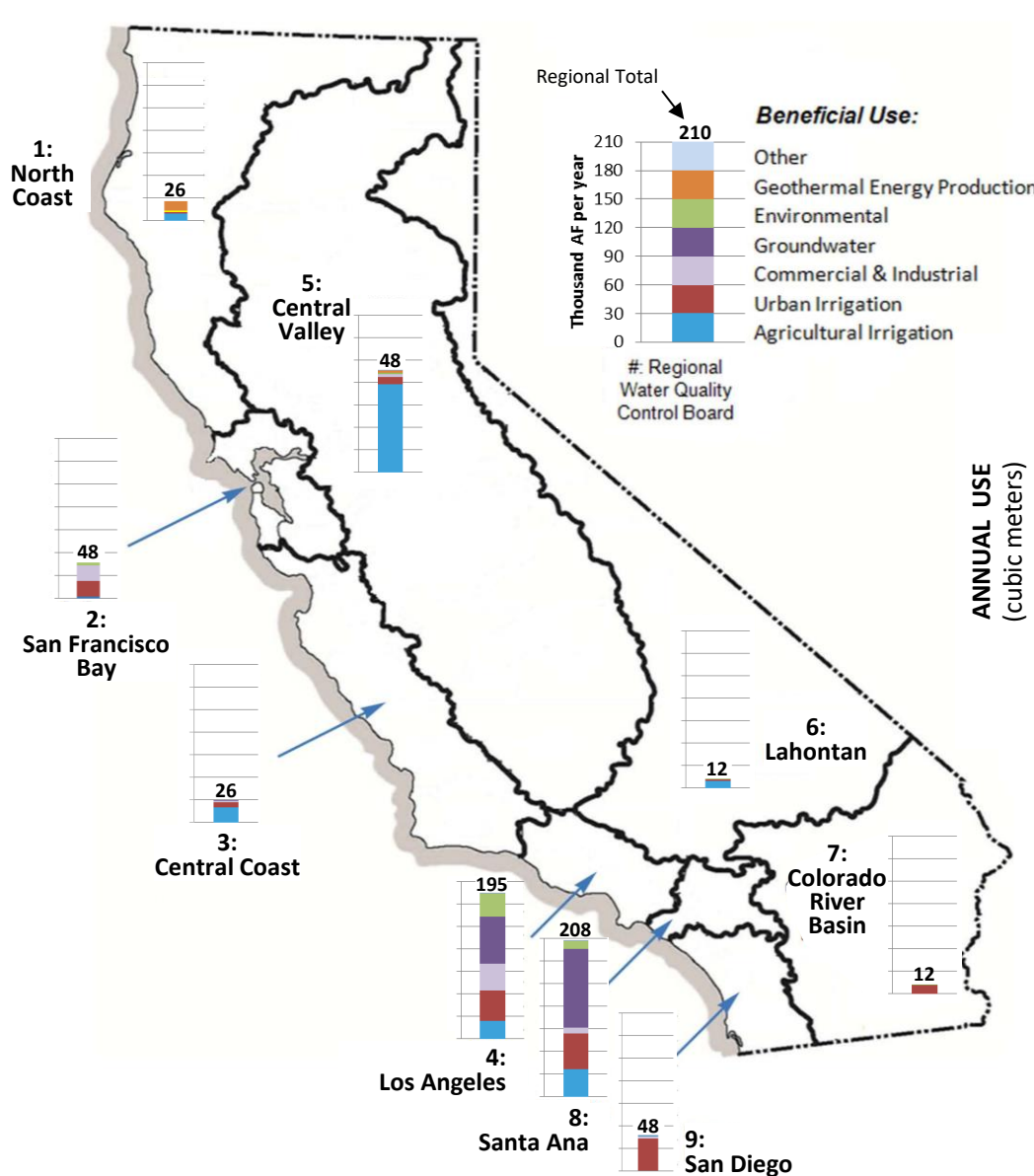


1. Golf Course and Landscape Irrigation were combined before 2009
2. Commercial use was included in Other before 2009
3. Seawater Intrusion Barrier and Groundwater Recharge were combined before 2001

# Volumetric Changes in Beneficial Uses



# Beneficial Uses Vary By Region




# Treatment Levels Defined in Title 22



Treatment Level	General Description
Advanced	Reverse osmosis, micro- or nano-filtration, ozonation, advanced oxidation.
Disinfected Tertiary	Oxidized, filtered, and disinfected wastewater to achieve both bacterial and virus removal
Disinfected Secondary-2.2	Oxidized and disinfected wastewater with total coliform bacteria <2.2 MPN/100 mL
Disinfected Secondary-23	Oxidized and disinfected wastewater with total coliform bacteria <23 MPN/100 mL
Undisinfected Secondary	Oxidized wastewater

a: Based on California Code of Regulations Title 22, Section 60001 et seq.

# General Beneficial Uses<sup>a</sup> by Treatment Level



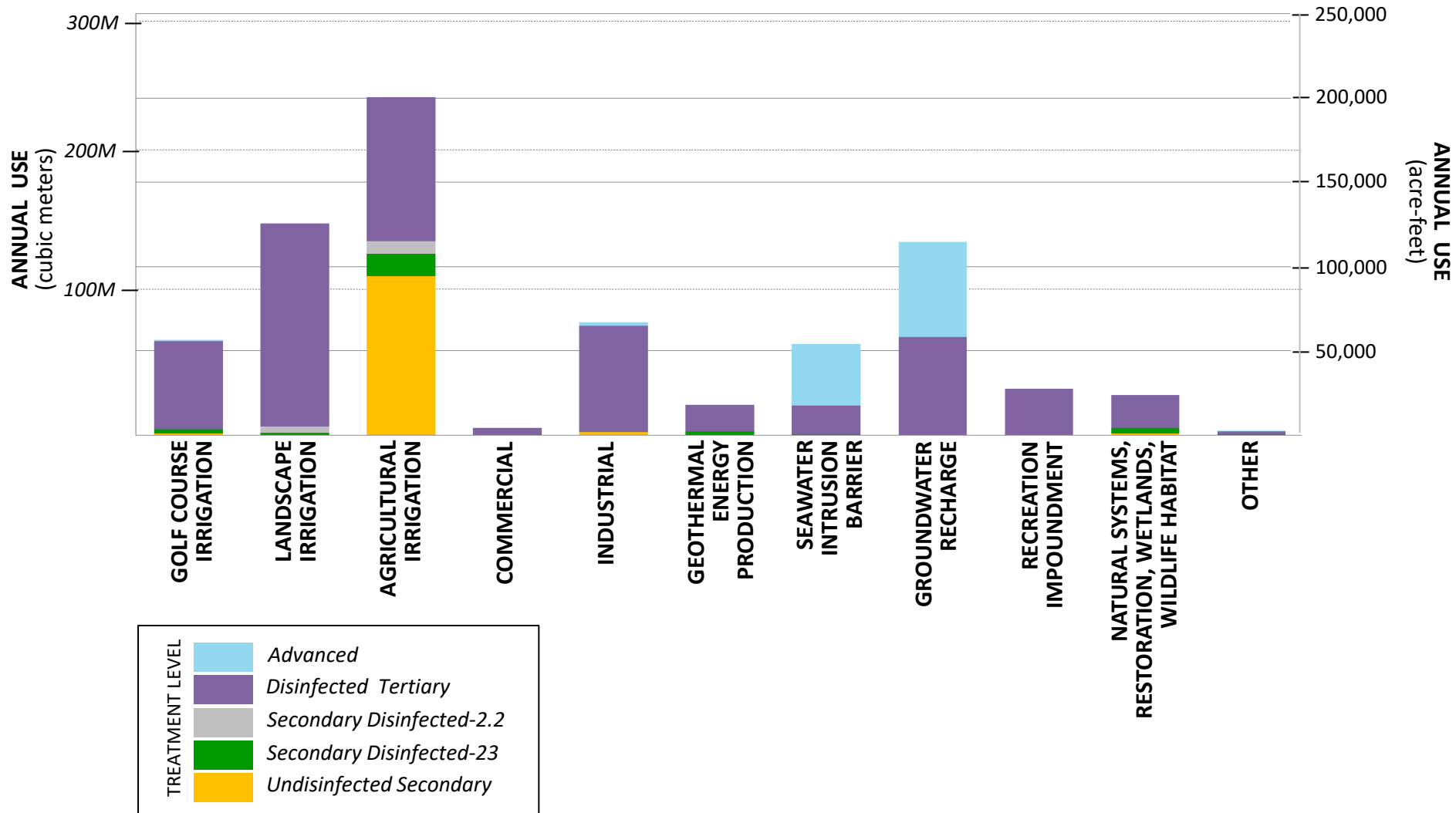
Treatment Level	Beneficial Uses Permitted by Title 22 <sup>b</sup>
Advanced	<ul style="list-style-type: none"> <li>• GWR by subsurface injection</li> <li>• SWIB by subsurface injection</li> <li>• To be considered as part of the surface reservoir augmentation and DPR.</li> </ul>
Disinfected Tertiary	<ul style="list-style-type: none"> <li>• URB - residential landscaping, golf courses, school yards</li> <li>• COM - laundries, artificial snow-making.</li> <li>• IND - process water with worker contact, cooling and air conditioning</li> <li>• GWR – by surface application</li> </ul>
Disinfected Secondary-2.2	<ul style="list-style-type: none"> <li>• AG - food crops with surface irrigation</li> <li>• IMP - restricted recreational impoundments</li> </ul>
Disinfected Secondary-23	<ul style="list-style-type: none"> <li>• AG - nurseries and sod farms with unrestricted access</li> <li>• URB - freeway landscaping, golf courses with restricted access</li> <li>• COM - boiler feedwater, concrete mixing, soil compaction</li> </ul>
Undisinfected Secondary	<ul style="list-style-type: none"> <li>• AG - fodder, fiber, and seed crops; nursery and sod farms irrigation</li> <li>• OTH - sanitary sewer flushing</li> </ul>

a: Based on California Code of Regulations Title 22, Section 60001 et seq.

b: Uses for increasing levels of treatment also include all uses for lower treatment levels.



# Beneficial Reuse by Treatment Level



# What's Next?

- Develop 2015 Survey web page
- Estimate a reasonable projection for 2020 recycled water use using the UWMPs and the completed 2015 survey
- Continue to evaluate the data set
- Streamline future surveys
- Develop (Water Board) permit language requiring monitoring and reporting recycled water use
- Continue to identify mechanisms for increasing statewide recycled water use

# Contact Information



**David A Balgobin, PE**

(916) 322-6042

[david.balgobin@waterboards.ca.gov](mailto:david.balgobin@waterboards.ca.gov)



**Toni Pezzetti, PG, CHG**

(916) 651-7024

[toni.pezzetti@water.ca.gov](mailto:toni.pezzetti@water.ca.gov)

