

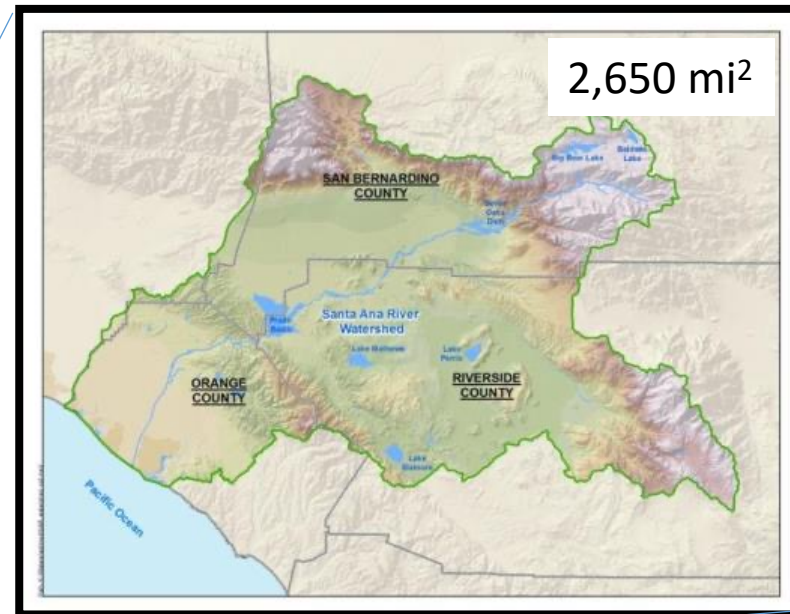
Salinity Management Benefits of Recycled Water Recharge

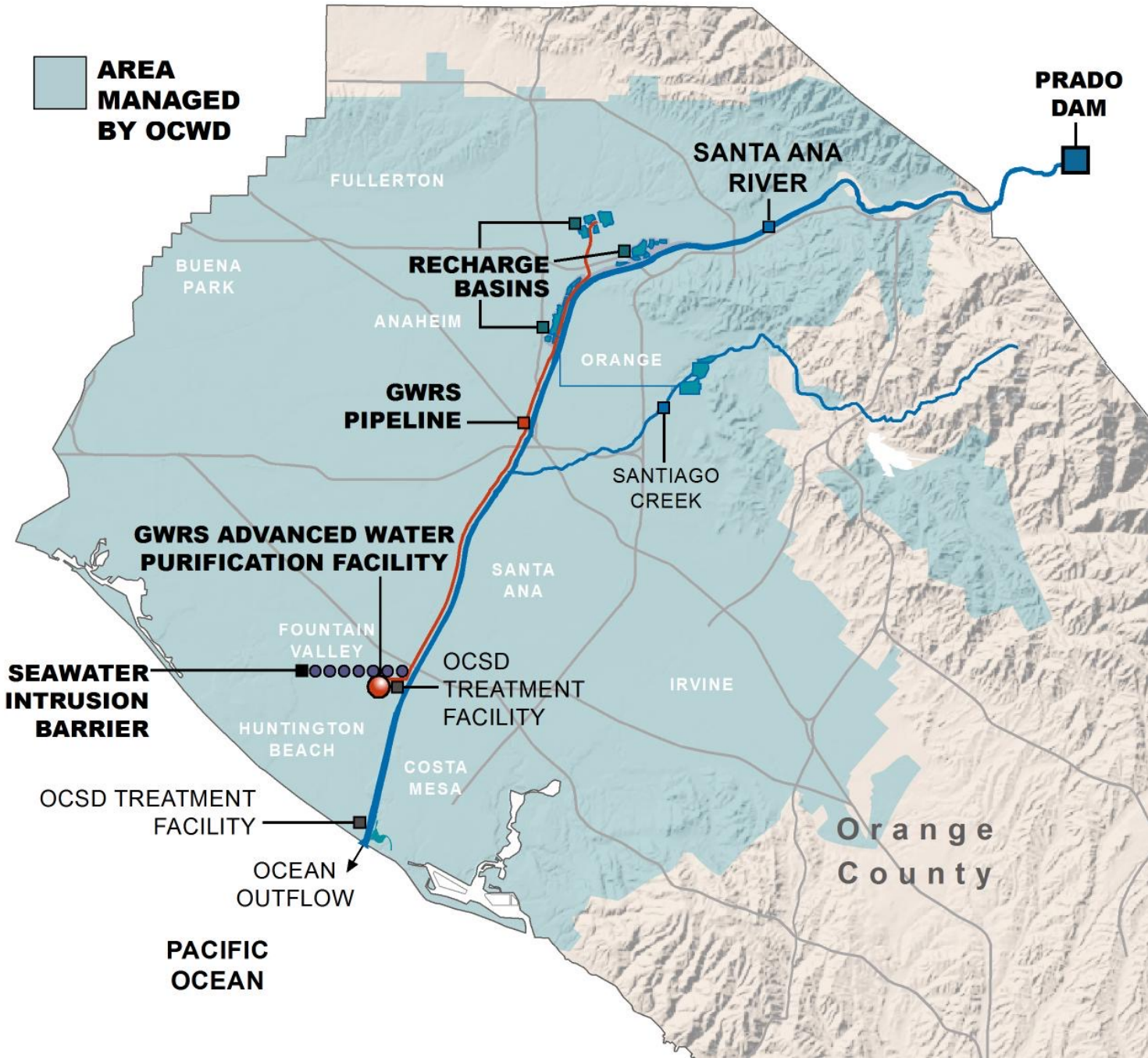
Greg D. Woodside, PG, CHg
Executive Director
of Planning & Natural Resources
Orange County Water District
gwoodside@ocwd.com

February 23, 2023

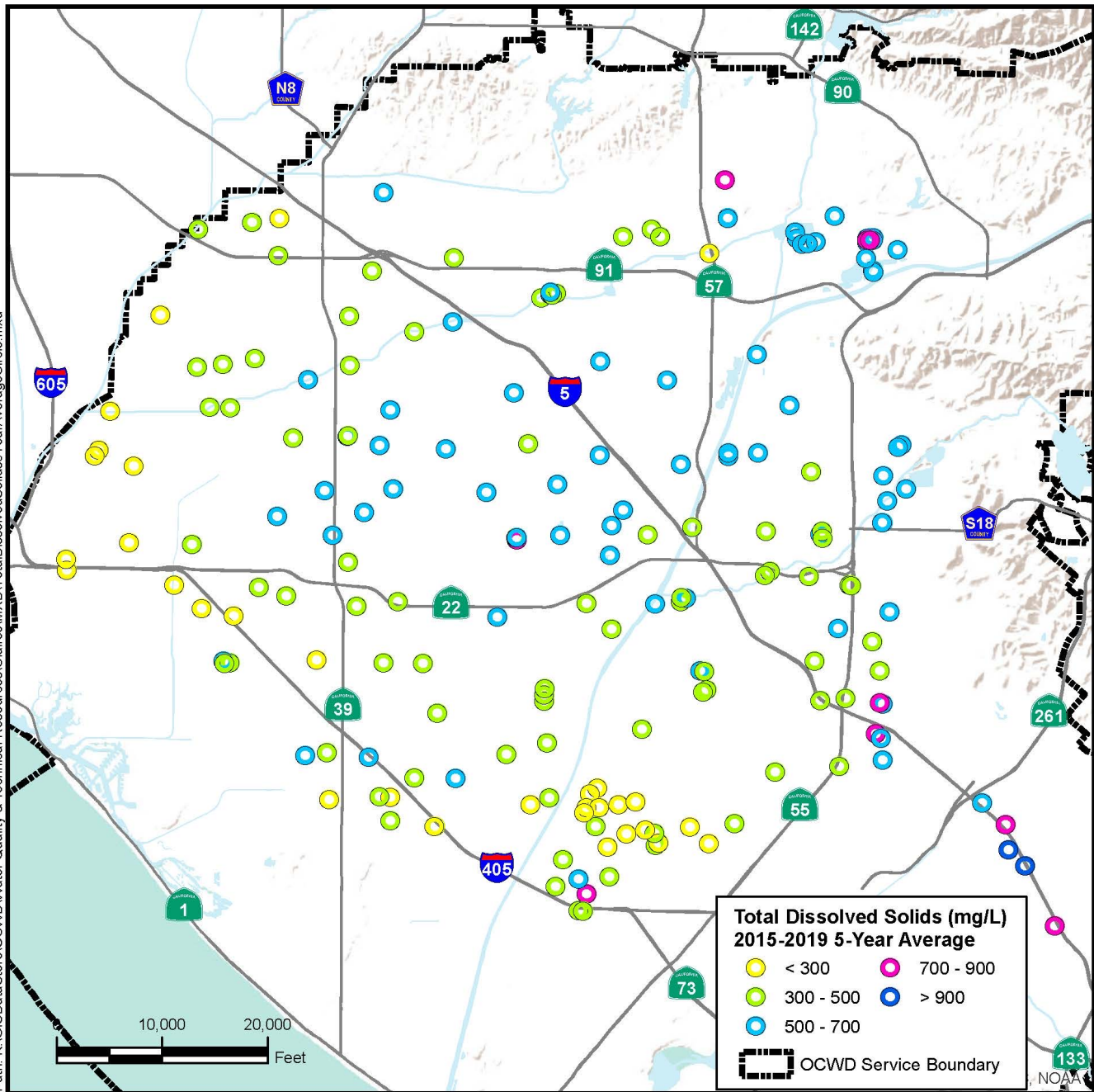


The Orange County, CA groundwater basin lies at the base of the Santa Ana River watershed.





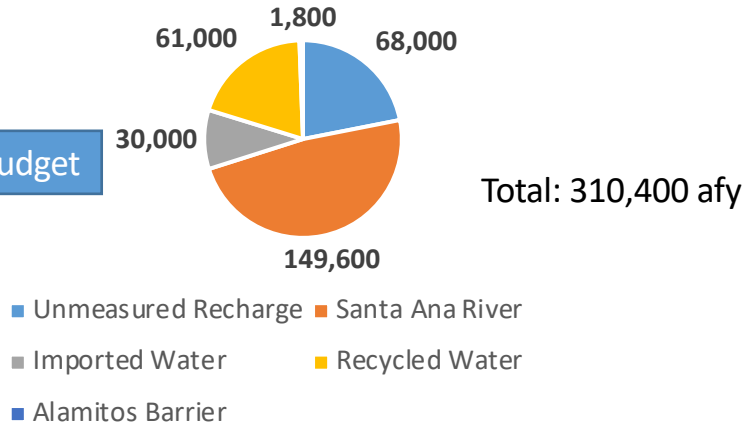
Path: K:\GISData\Store\OCWD\Water Quality & Technical Resources\Claire\JIM\XDT\TotalDissolvedSolids\5YearAverage\Circle.mxd



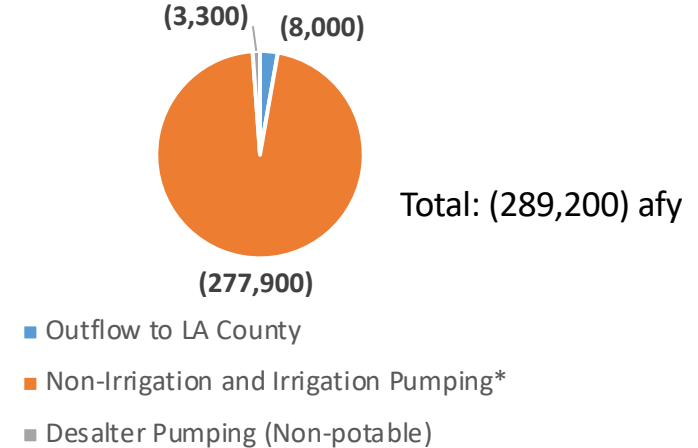
2004-21 Average Inputs/Outputs to OC Basin

Avg Basin Inflow (afy): 2004-2021

Water Budget

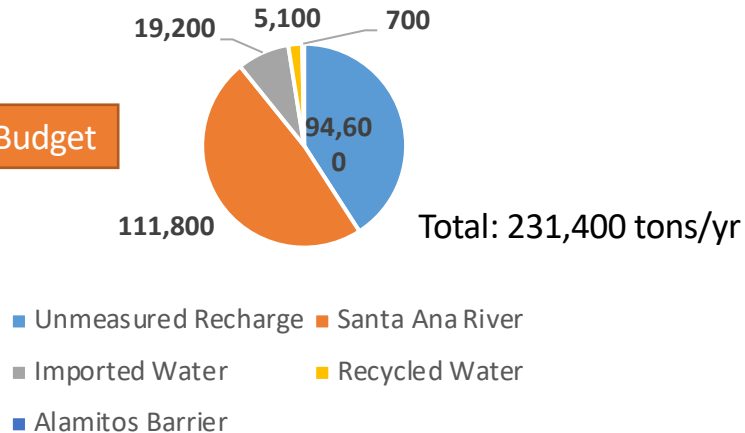


Avg Basin Outflow (afy): 2004-21

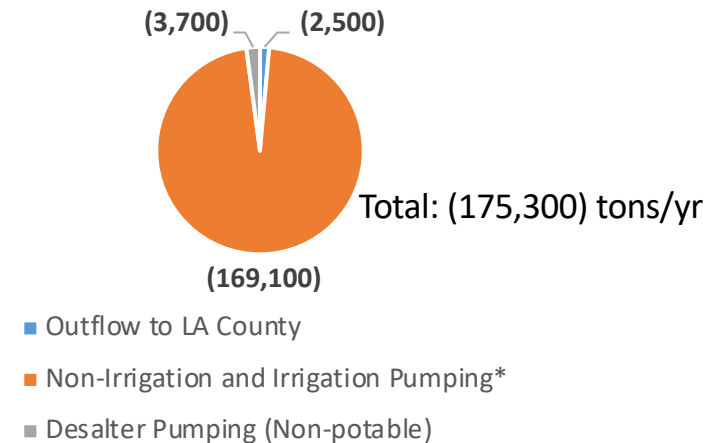


Avg Basin Salt Loading (tons/yr): 2004-2021

Salinity Budget



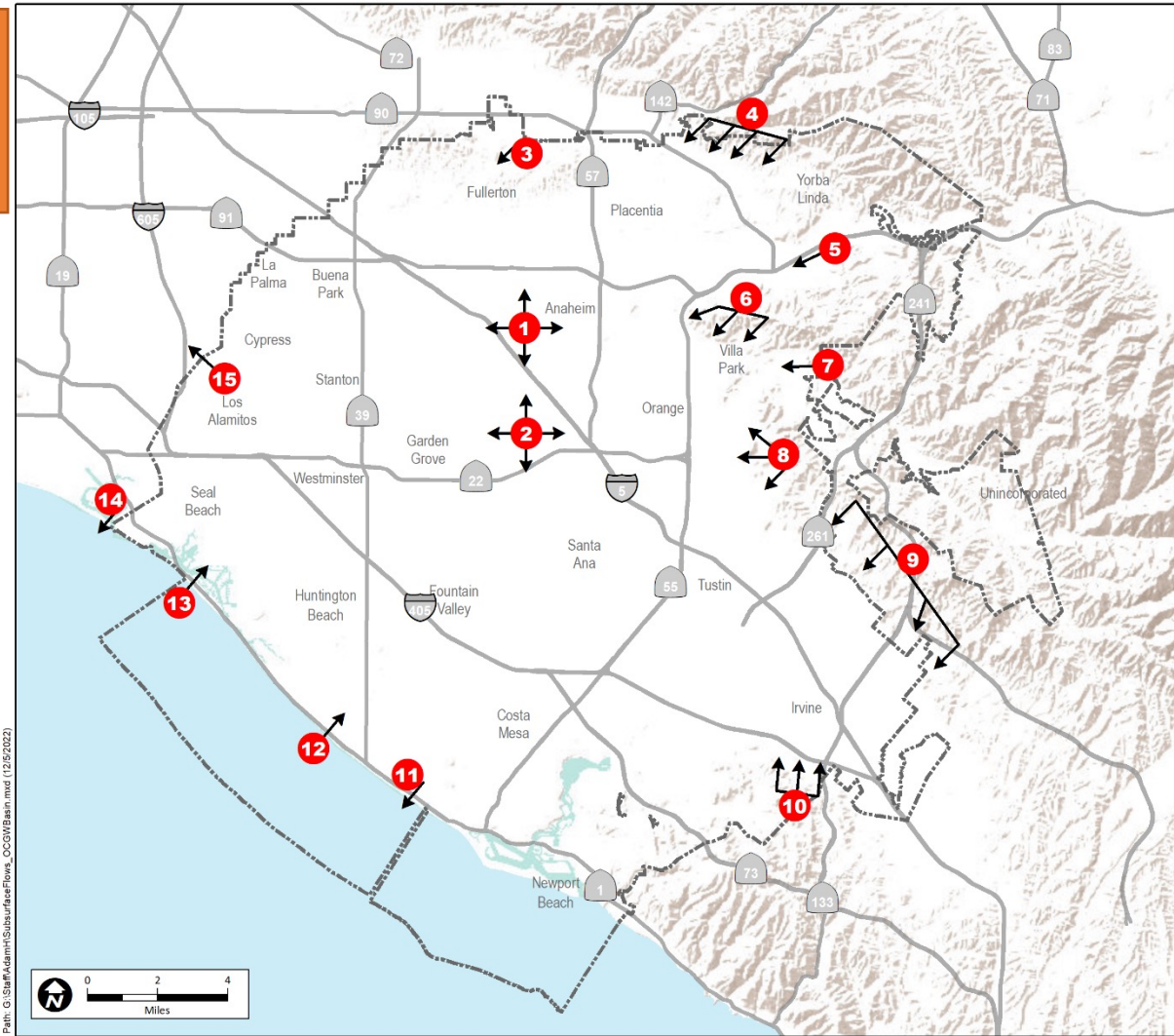
Avg Basin Salt Outflow (tons/yr): 2004-21



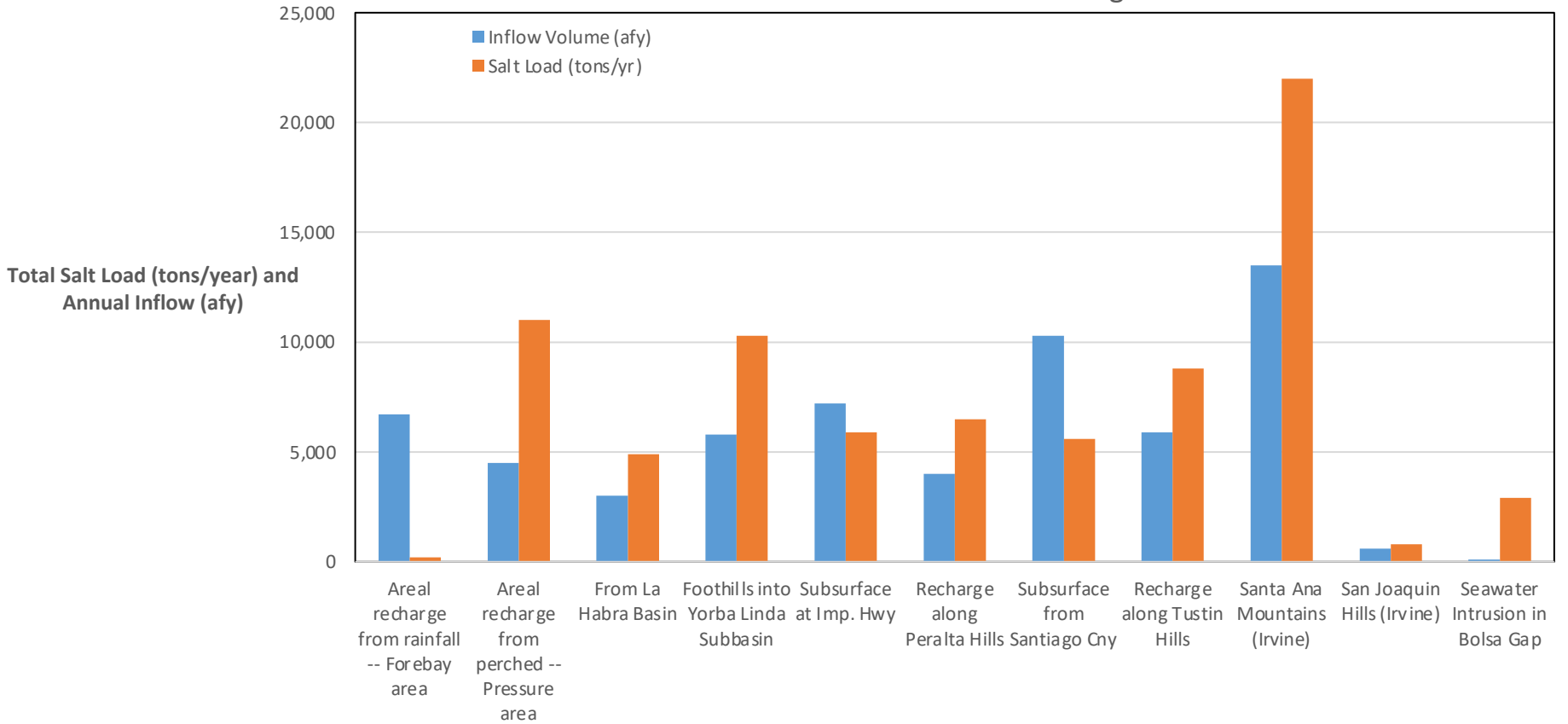
Note: excludes localized seawater intrusion along coastline

Average Unmeasured Recharge in the OC Basin

Flow Source	Volume (afy)	TDS (mg/L)
1 Rainfall	13,100	100
2 Perched Recharge (i.e., applied water)	4,500	1,800
3 From La Habra Basin	3,000	1,200
4 Foothills into Yorba Linda Subbasin	5,800	1,300
5 Subsurface at Imperial Hwy	7,200	600
6 Recharge along Peralta Hills	4,000	1,200
7 Subsurface from Santiago Canyon	10,300	400
8 Recharge along Tustin Hills	5,900	1,100
9 Santa Ana Mountains (Irvine)	13,500	1,850
10 San Joaquin Hills (Irvine)	600	940
11 Outflow Through Talbert Gap	(2,400)	86
12 Seawater in Bolsa Gap	90	24,000
13 Seawater in Sunset Gap	2,600	24,000
14 Outflow through Alamitos Gap	(200)	300
15 Outflow to LA County	(7,990)	230
Net Incidental Recharge:	60,000	

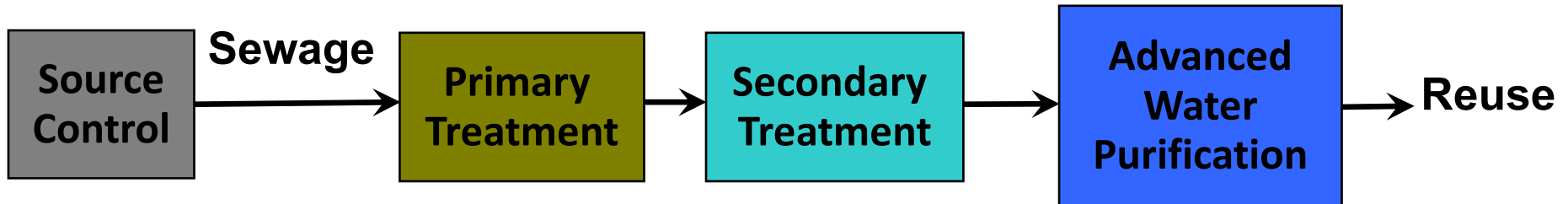


Annual Flow and Salt Load for Unmeasured Recharge





Agency Responsibilities



OCWD & OCSD: Turning

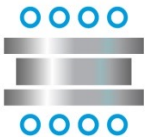
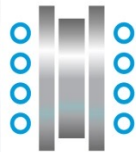
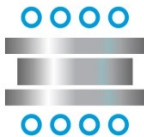
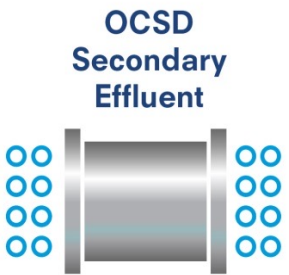


Seawater Barrier
(36 well sites)

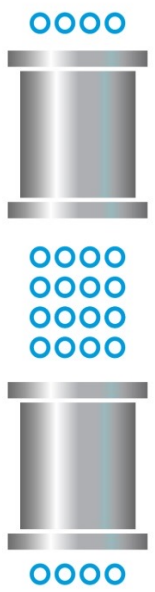
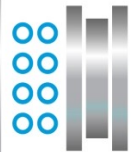
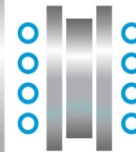
Microfiltration (MF)

Reverse Osmosis (RO)

Ultraviolet Light (UV)
with Hydrogen Peroxide



Brine discharged via
OCSAN ocean outfall

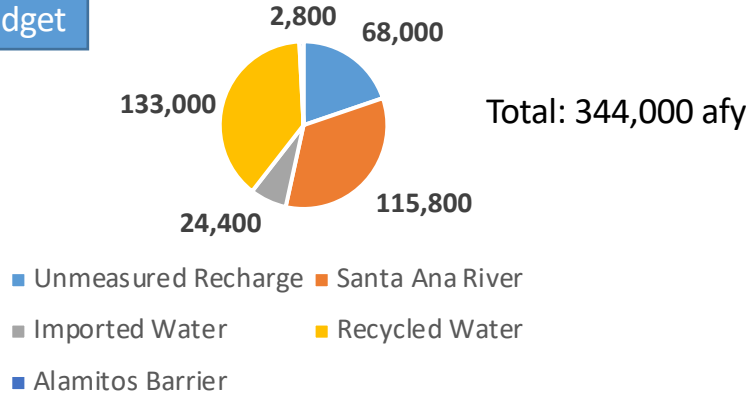


Recharge Basins in
Anaheim

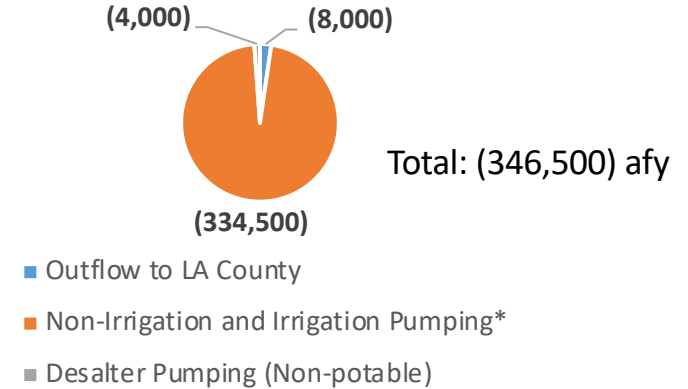
Projected Average Inputs/Outputs to OC Basin SWP Imported

Avg Basin Inflow (afy):
10-Yr Projection (2042-2051)

Water Budget

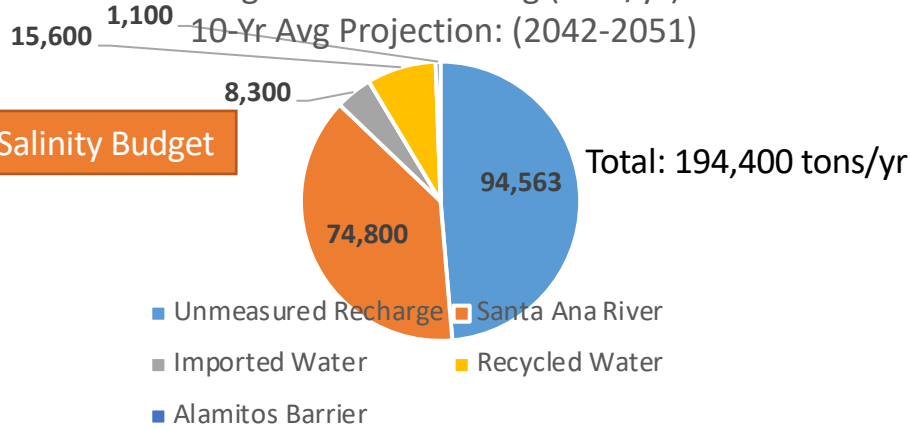


Avg Basin Outflow (afy):
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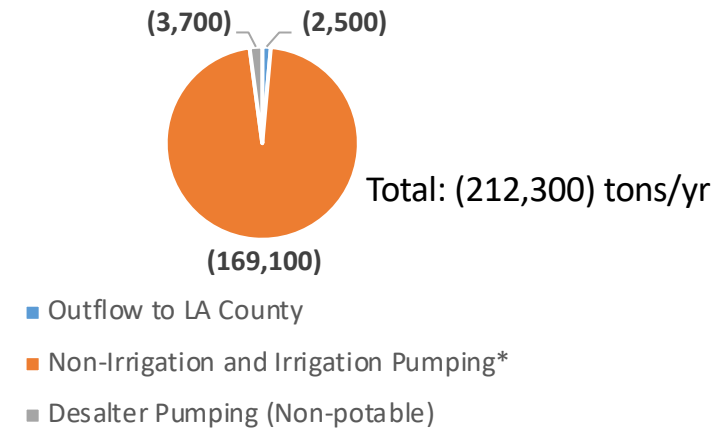


Avg Basin Salt Loading (tons/yr):
10-Yr Avg Projection: (2042-2051)

Salinity Budget



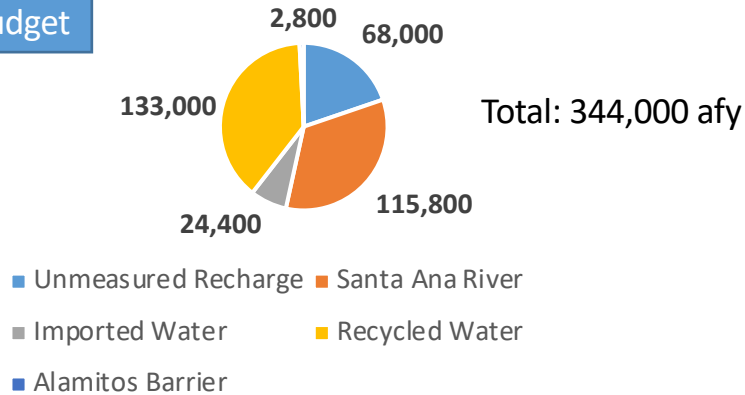
Avg Basin Salt Outflow (tons/yr): 2004-21



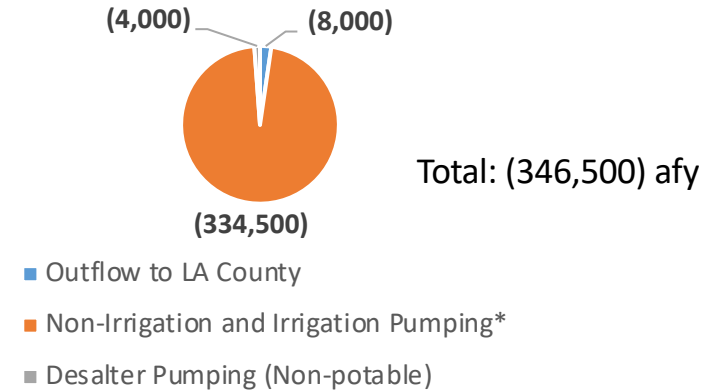
Projected Average Inputs/Outputs to OC Basin Colorado River Imported

Avg Basin Inflow (afy):
10-Yr Projection (2042-2051)

Water Budget

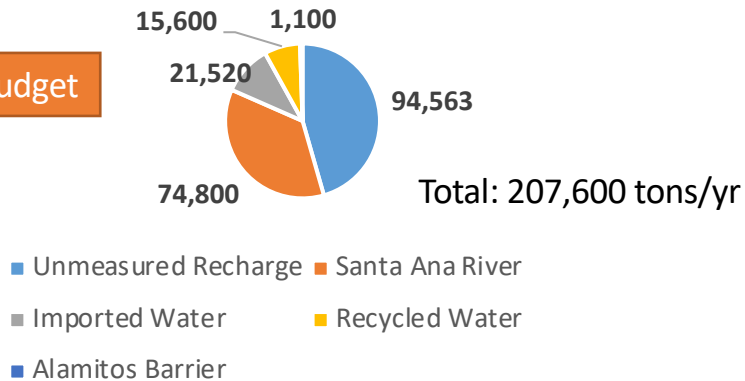


Avg Basin Outflow (afy):
10-Yr Projection (2042-2051)

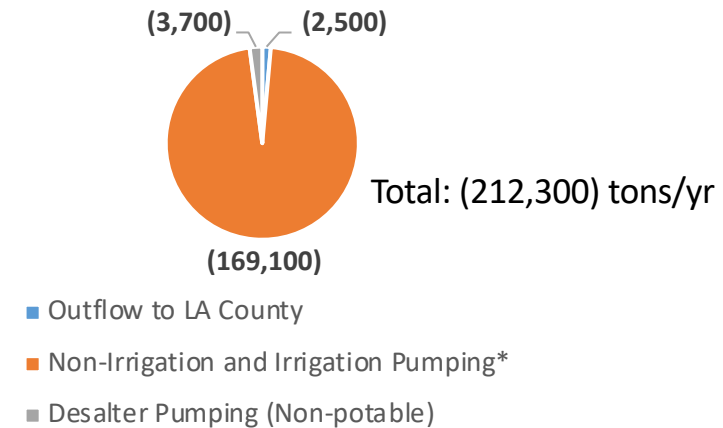


Avg Basin Salt Loading (tons/yr):
10-Yr Avg Projection: (2042-2051)

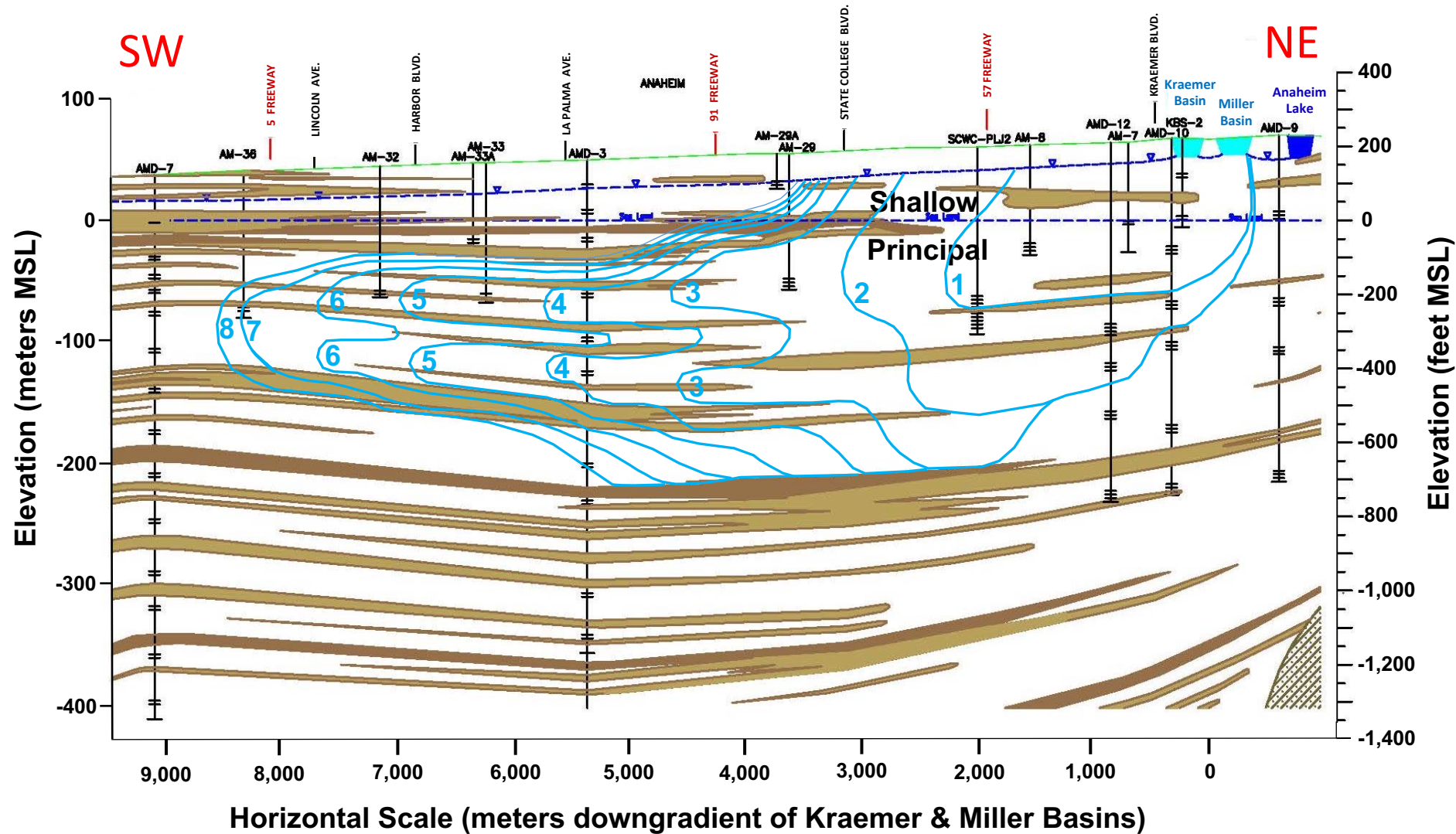
Salinity Budget



Avg Basin Salt Outflow (tons/yr): 2004-21



GWRS water migrated approx. 200 meters vertically and 8,000 meters laterally from 2008 to 2016



Projected Change in TDS in OC Groundwater Basin

