

90 Years of Groundwater Replenishment on the Oxnard Coastal Plain: Past Successes and Concerns for the Future

*John Lindquist (speaker) and
Murray McEachron*

**UNITED WATER CONSERVATION
DISTRICT**



STATE WATER RESOURCES CONTROL BOARD:

- “In terms of water supply, **we need to store as much water in the ground as possible when we have it.**”

*Saticoy
Spreading
Grounds,
2014*



Max Gomberg, Climate and Conservation Manager, in interview with News Deeply, “How Climate Change Will Affect the Future of California Water” December 21, 2016

ENVIRONMENTAL DEFENSE FUND:

*“When we talk about the need for water storage in California, **we must take full inventory of the tremendous opportunity of our underground natural storage infrastructure.** If we focus on this now, we’ll be able to take advantage of the next wet winter.”*

Maurice Hall, EDF blog “The Hidden Opportunity for Water Storage in California,” June 1, 2017

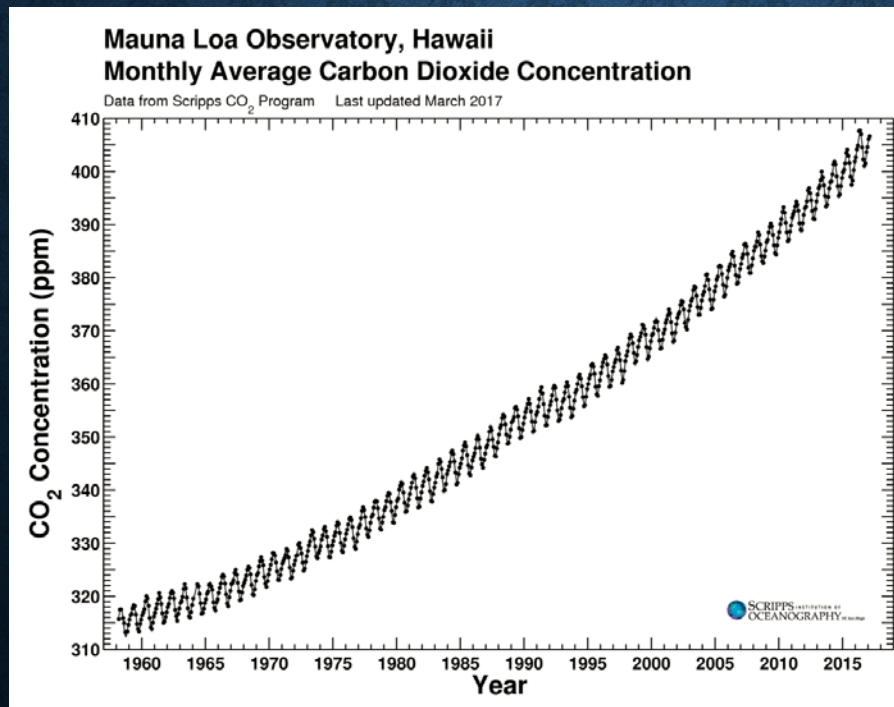
*Saticoy
Spreading
Grounds,
2017*



UNION OF CONCERNED SCIENTISTS:

“Groundwater is really our buffer to climate change impacts in California.”

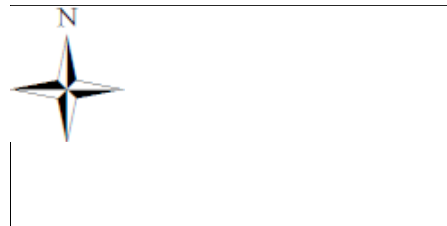
Juliet Christian-Smith, Senior Climate Scientist, in interview with News Deeply, “How Climate Change Will Affect the Future of California Water” December 21, 2016



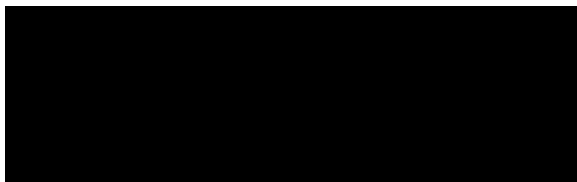
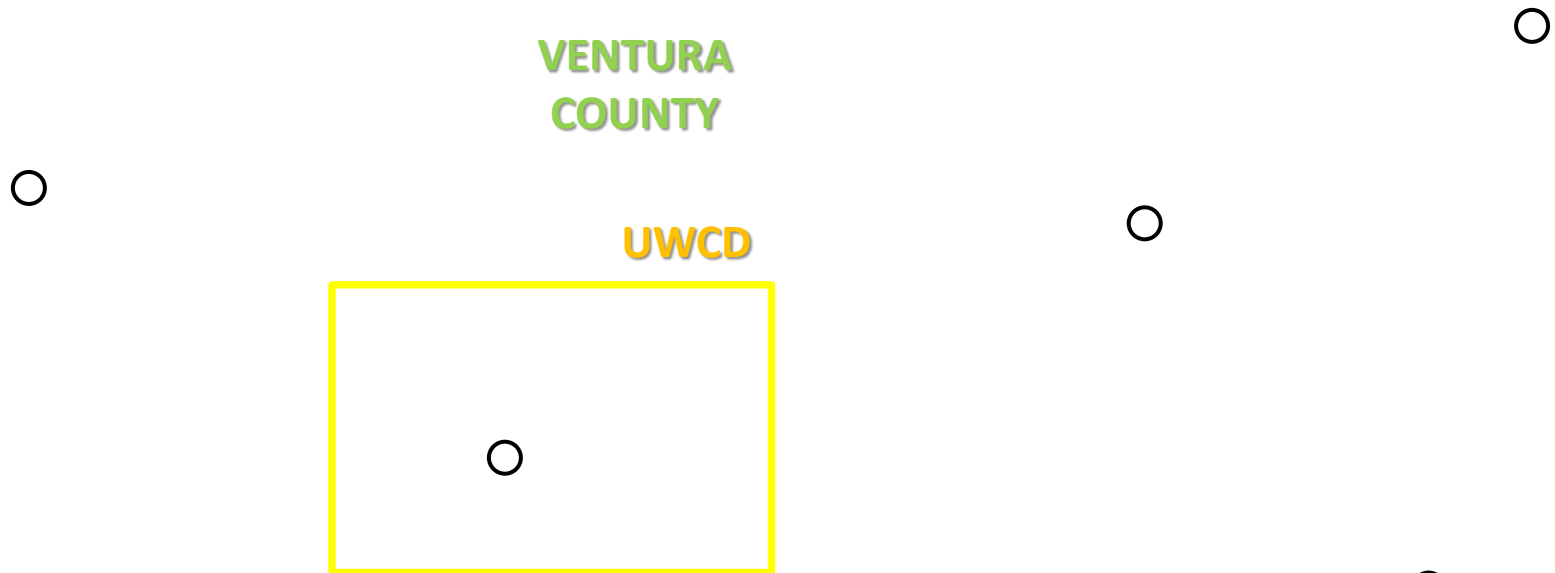
*From Scripps
CO₂ program,
March 2017*

OUTLINE

1. Location and setting
2. United's recharge operations and their impacts
3. Potential challenges in the future
4. Alternatives
5. Could artificial recharge benefit you?



VENTURA COUNTY AND UNITED WCD



OXNARD COASTAL PLAIN



Freeman Diversion

Ventura



United WCD
Spreading
Grounds

Camarillo

Oxnard

Port
Hueneme

NBVC
Pt. Mugu



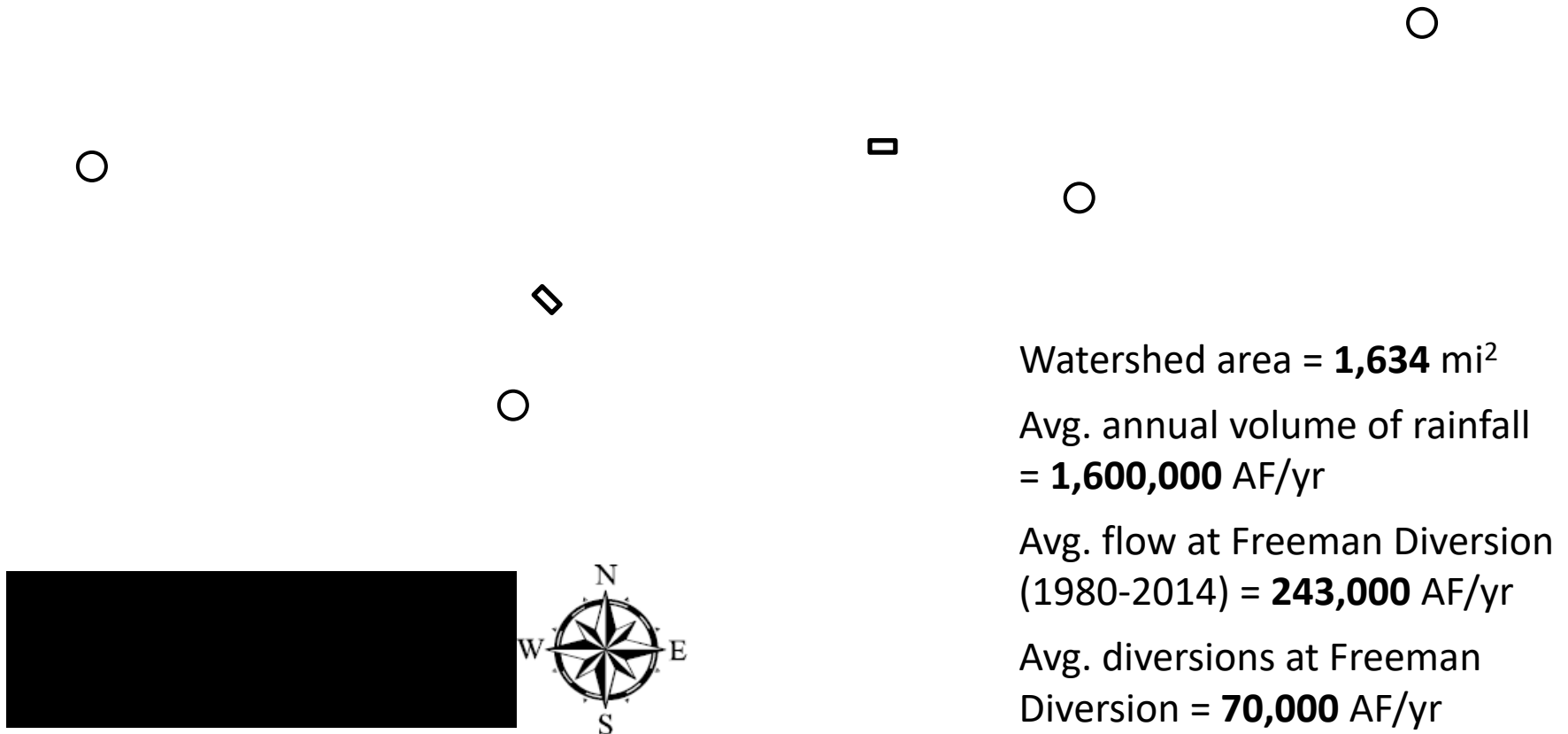
OXNARD COASTAL PLAIN SUMMARY



Basic information:

- Population: 400,000 people
 - Military facilities: 3
- Farmland: 35,000 acres
 - ~500,000 tons/yr produce
 - ~\$800 million economic impact
- Current water needs: 139,000 AF/yr

SANTA CLARA RIVER—KEY FEATURES



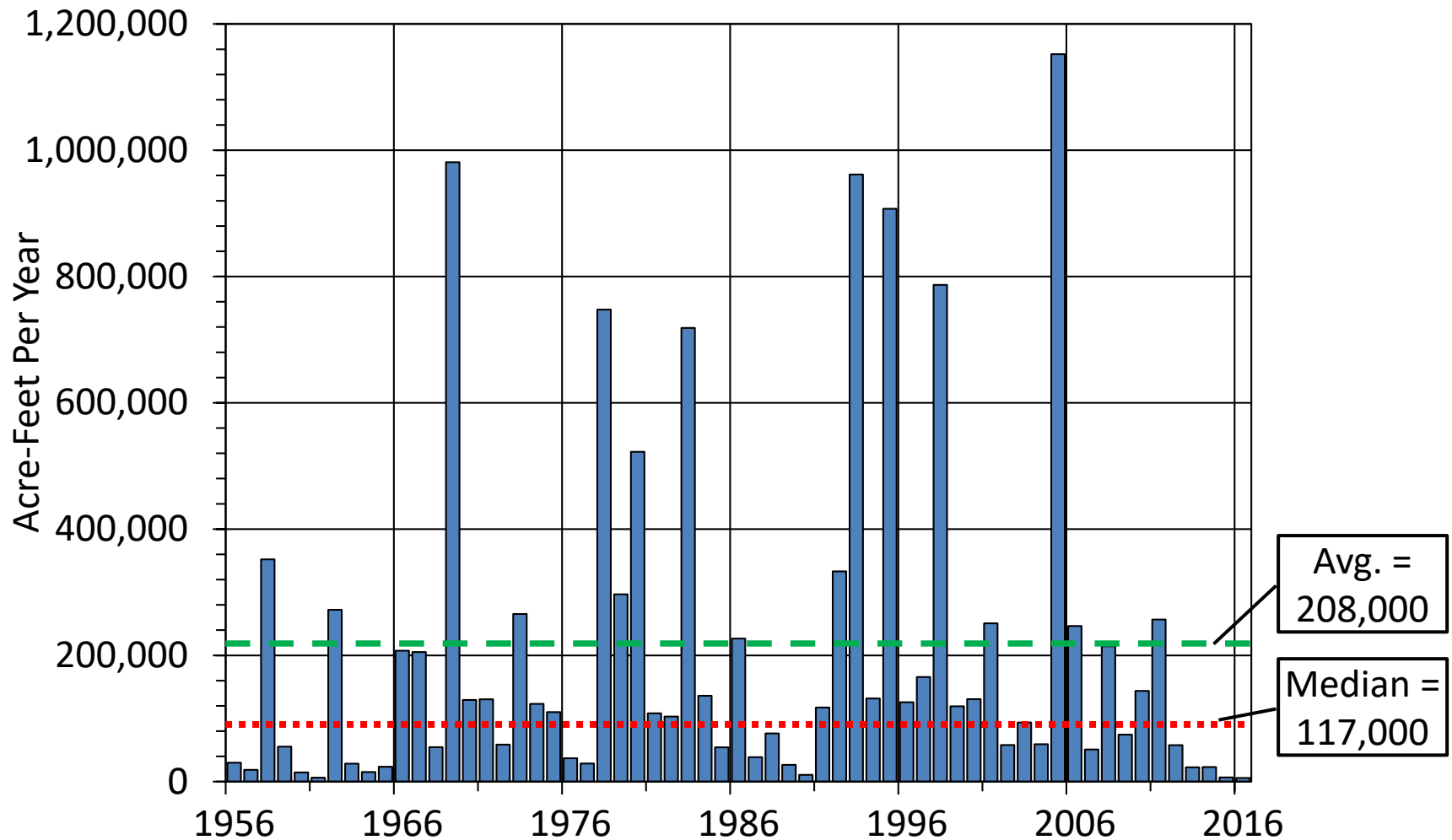
NOT THE SANTA CLARA RIVER, UNFORTUNATELY



THIS IS THE SANTA CLARA RIVER...



ANNUAL DISCHARGE, ACRE-FEET PER YEAR



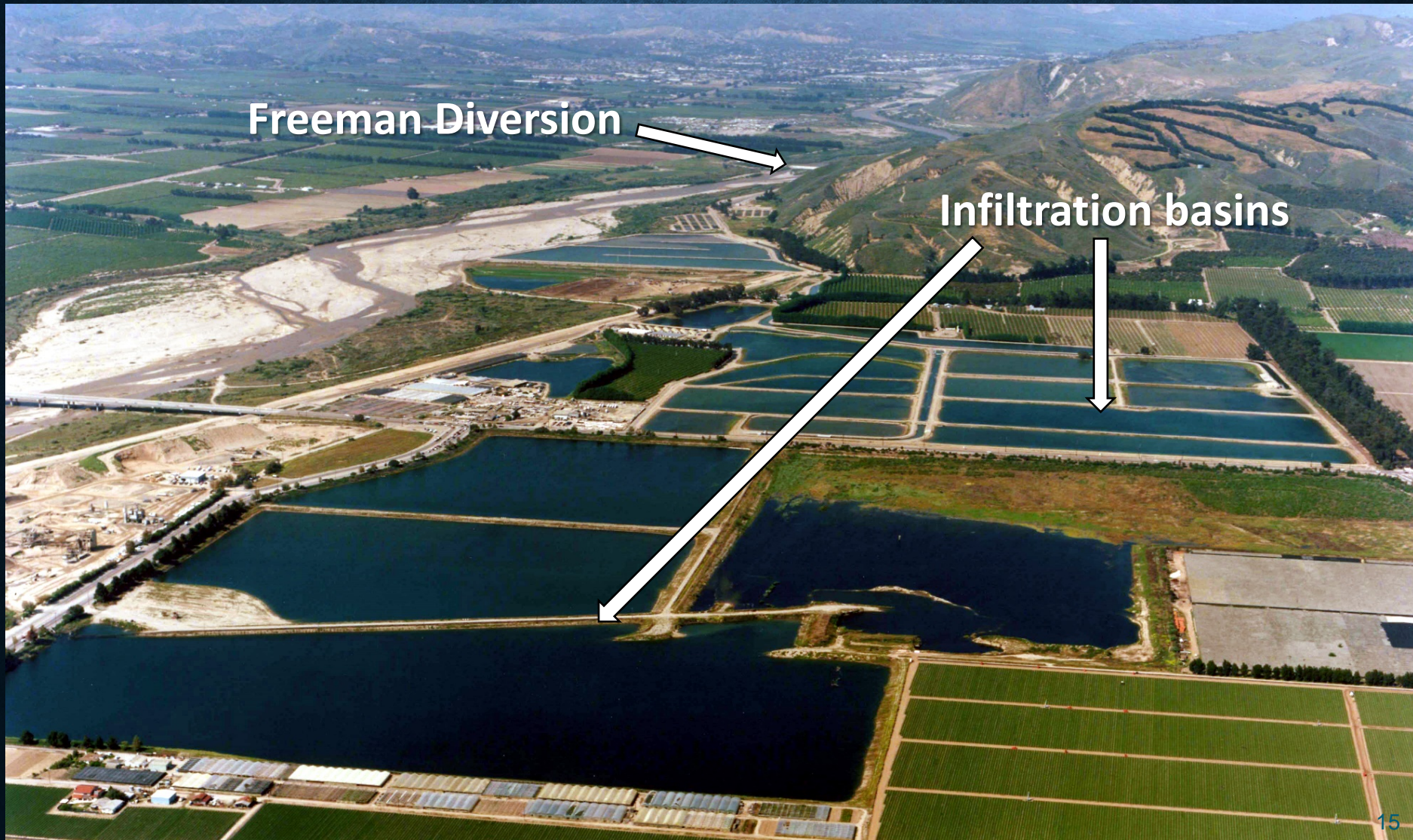
Saticoy Diversion, circa 1930s



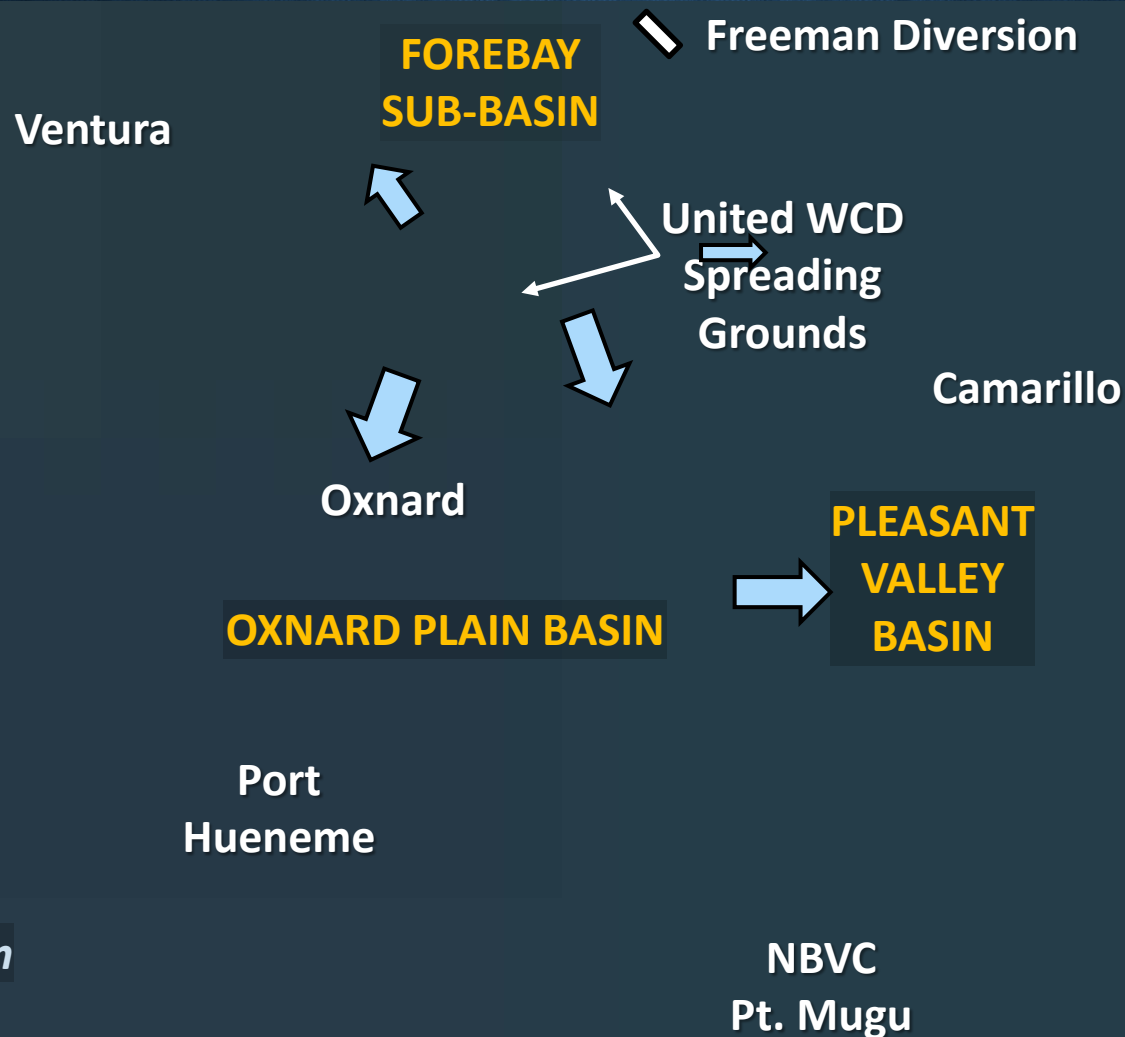
Freeman Diversion 1992-present



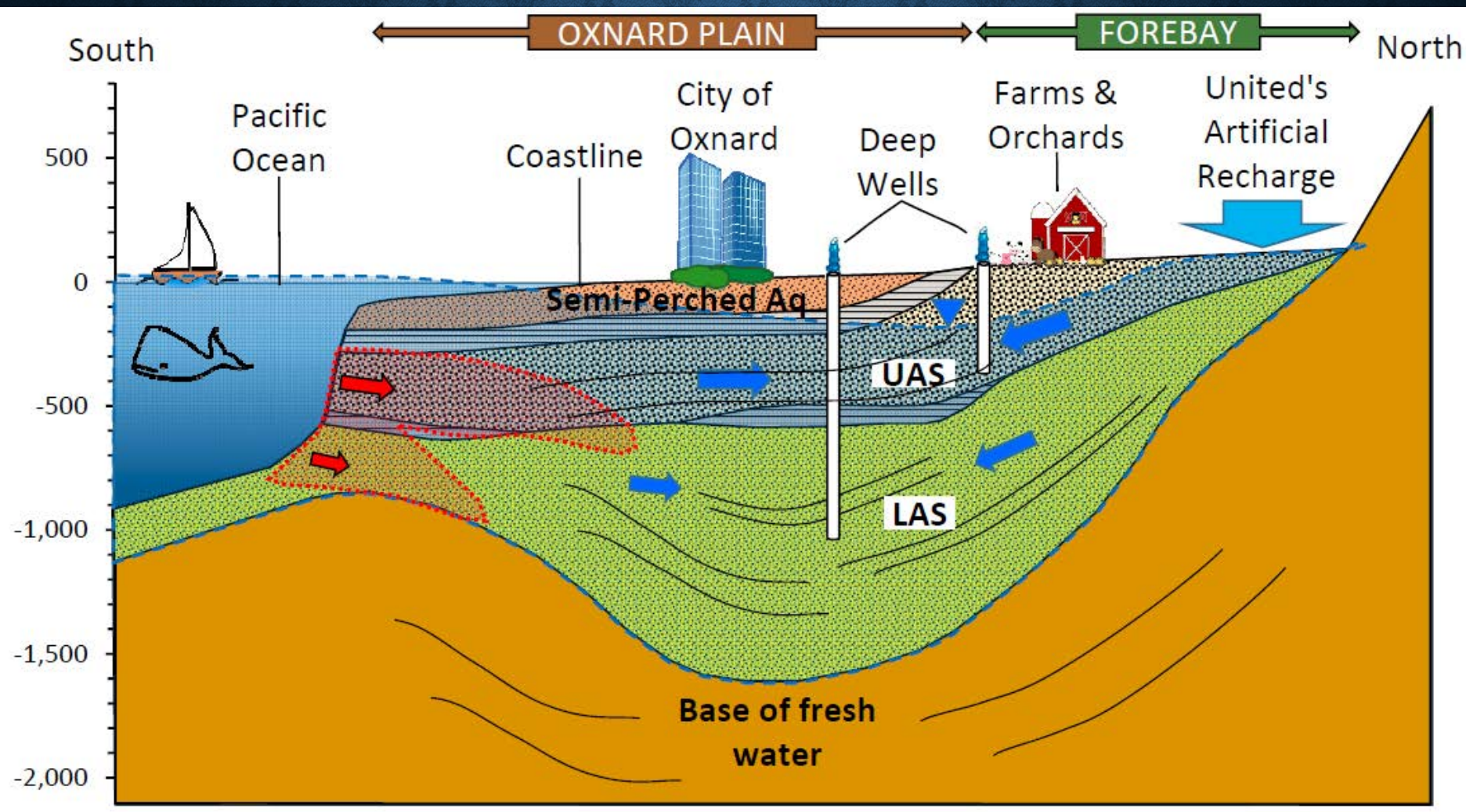
Saticoy Spreading Grounds, 2005



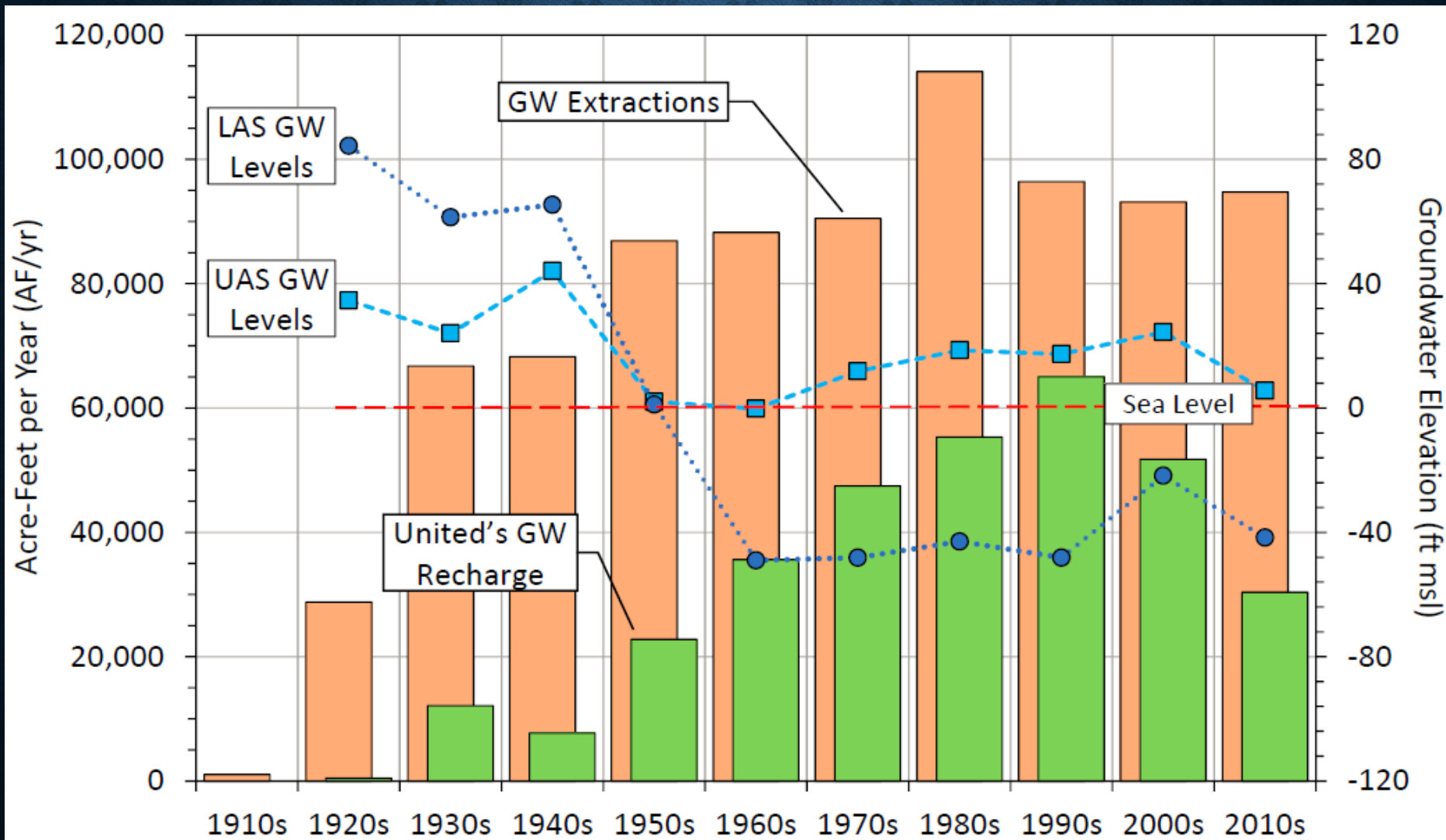
OXNARD COASTAL PLAIN



CONCEPTUAL MODEL



PUMPING, RECHARGE, AND GW LEVELS

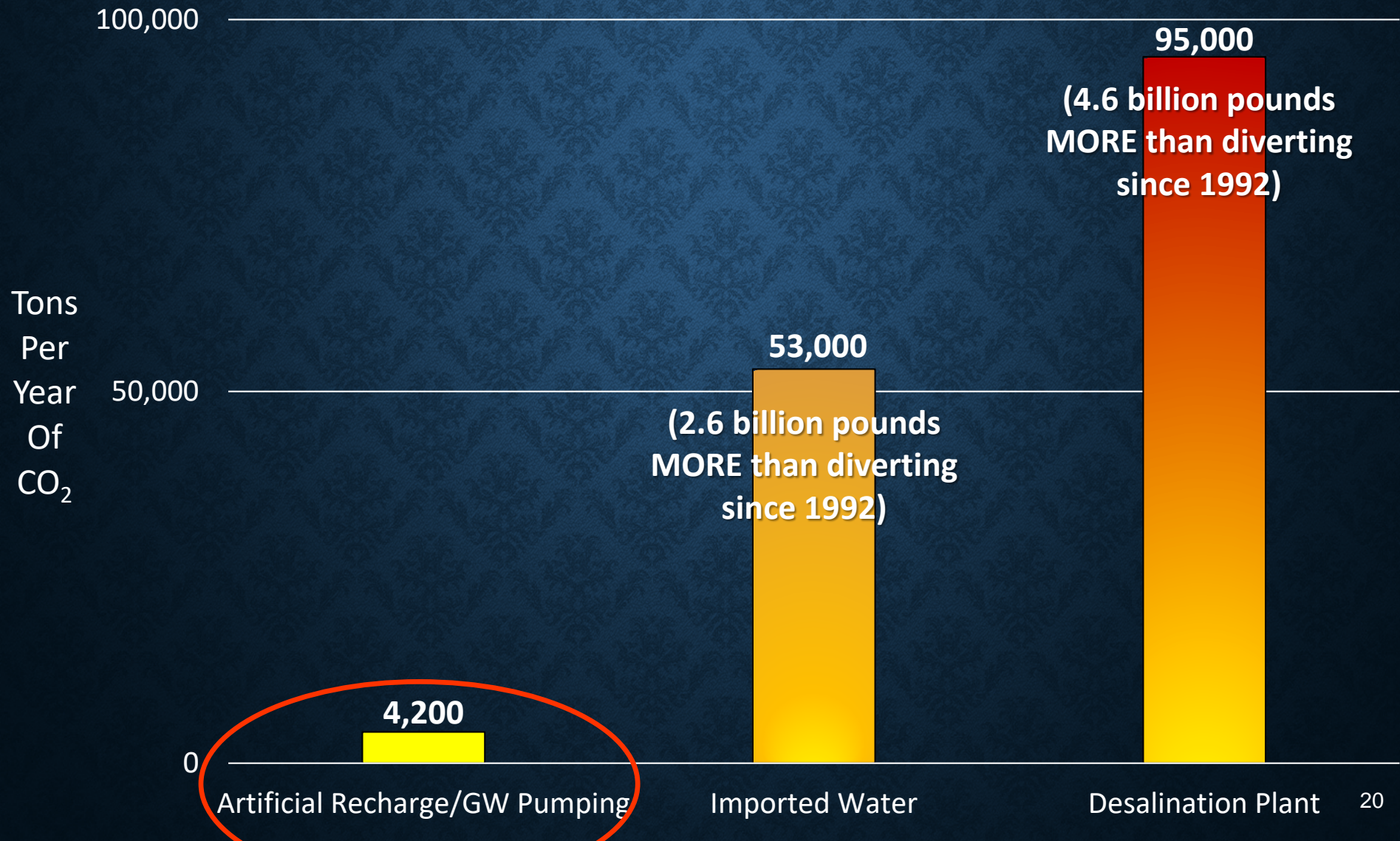


BENEFITS OF USING THIS LOCAL RESOURCE

1. Very small energy (and GHG) footprint
2. Minimal ecological impacts in other river basins
3. Provides low-cost water for local agriculture and cities:
 - a. Solid economic base for Ventura County
 - b. Residents want to maintain agricultural landscape
 - c. Short farm-to-table distances
 - d. Less agricultural expansion elsewhere
(e.g. slash and burn in the Amazon)



ESTIMATED GHG EMISSIONS TO PROVIDE 70,000 AF/YR OF WATER TO THE OXNARD COASTAL PLAIN:



SOMETIMES, LESS IS MORE...

Energy and Environment

The Washington Post

Carbon dioxide in the atmosphere is rising at the fastest rate ever recorded

By **Chelsea Harvey** March 13 at 4:33 PM

This story has been updated.

For the second year in a row, atmospheric carbon dioxide concentrations have risen, according to the National Oceanic and Atmospheric Administration, carbon dioxide levels in 2015 and 2016 and now rest at about 405 parts per million.



CONCERNS FOR THE FUTURE: 1) CLIMATE CHANGE

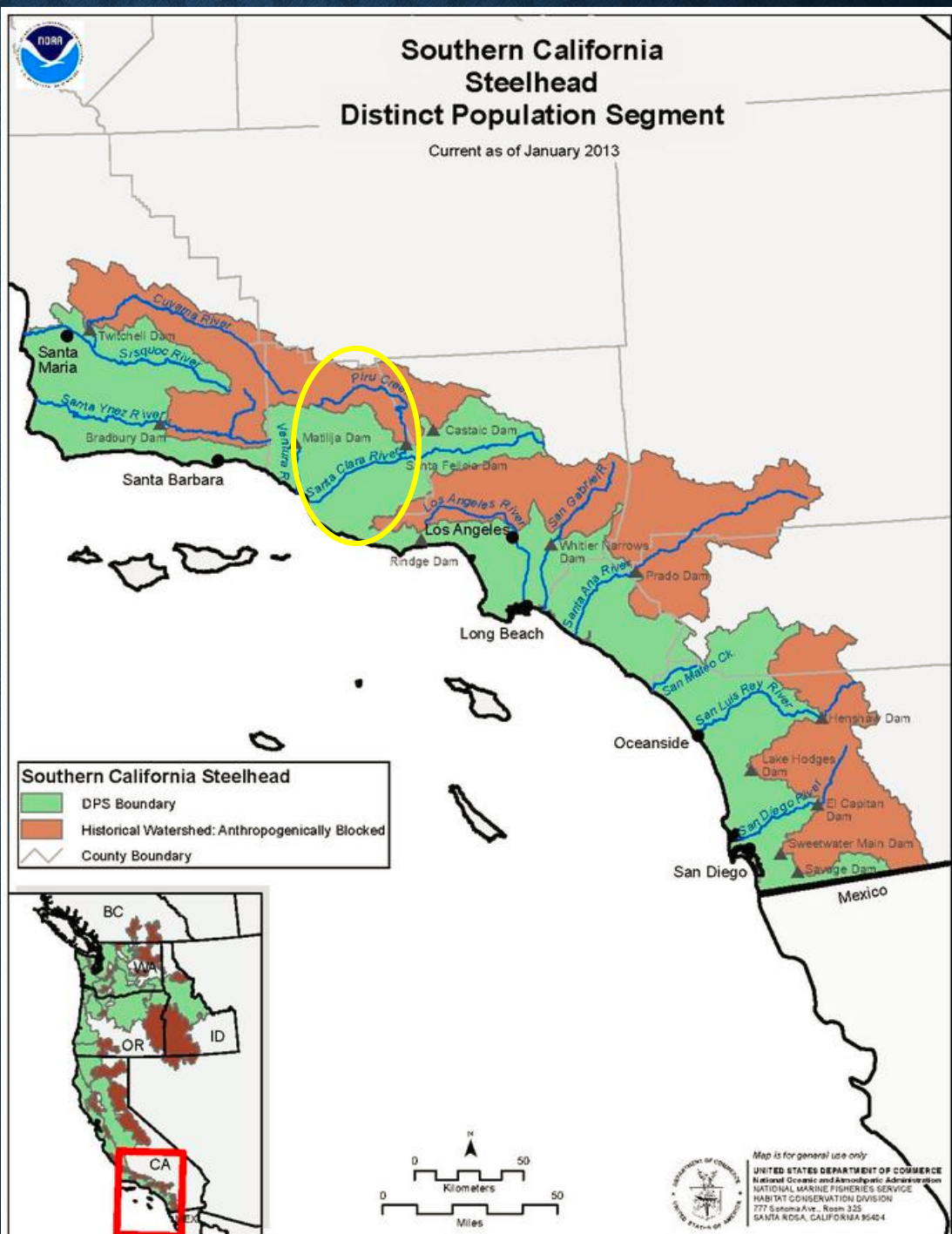


CONCERNS FOR THE FUTURE: 2) SGMA

Groundwater basins currently overdrafted, need to “make up” the gap:

1. Reduce demand (conservation)
2. Increase yield (“smarter” use of existing supplies)
3. Consider new/expanded water-supply projects:
 - a. Recycled water
 - b. Imported water
 - c. Desalination of seawater or brackish water

CONCERNS FOR THE FUTURE: 3) ENDANGERED SPECIES ACT



IMPACT OF REDUCING DIVERSIONS BY 15,000 AF/YR

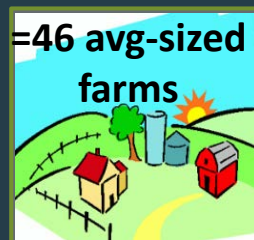
Freeman Division

Ventura

Camarillo

Oxnard

Port
Hueneme



= 90,000 tons/yr
of produce
(enough for
260,000 people)

=\$90 million/yr
direct income

NBVC
Pt. Mugu



WHERE COULD THAT LOST PRODUCTION BE REPLACED? MAYBE THE COACHELLA VALLEY...

Salton sea faces catastrophic future, toxic dust storms, officials say



Dead trees, debris and dead fish dot the shoreline of the Salton Sea. (Mark Boster / Los Angeles Times)

OR THE COLORADO RIVER BASINS?

Shrinking Colorado River is a growing concern for Yuma farmers — and millions of water users



Irrigation channels near Yuma, Ariz. At left is a cotton field. (Irfan Khan / Los Angeles Times)

HOW ABOUT MEXICO?

Baja California farmers confront prospect of water shortage



Hector Ochoa Martinez, an irrigation technician, moves through the unlined canals of a cotton field in San Luis Río Colorado, Mexico. (Misael Virgen / San Diego Union-Tribune)

COULD ARTIFICIAL RECHARGE WORK FOR YOU?

Some Notable Benefits...

- Relatively low-cost source of water (helps local ag and economically disadvantaged)
- Low-cost/low-impact storage
- Resilient to natural disasters
- Improves groundwater quality
- Low GHG emissions
- No impacts to Delta or Colorado River watersheds

And Some Challenges...

- Climate change impacts will add difficulty/cost ✓
- Current diversion volumes are insufficient to achieve sustainability (SGMA) ✓
- Finding the right balance with T&E species

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