

## Lake Elsinore & San Jacinto Watersheds Authority

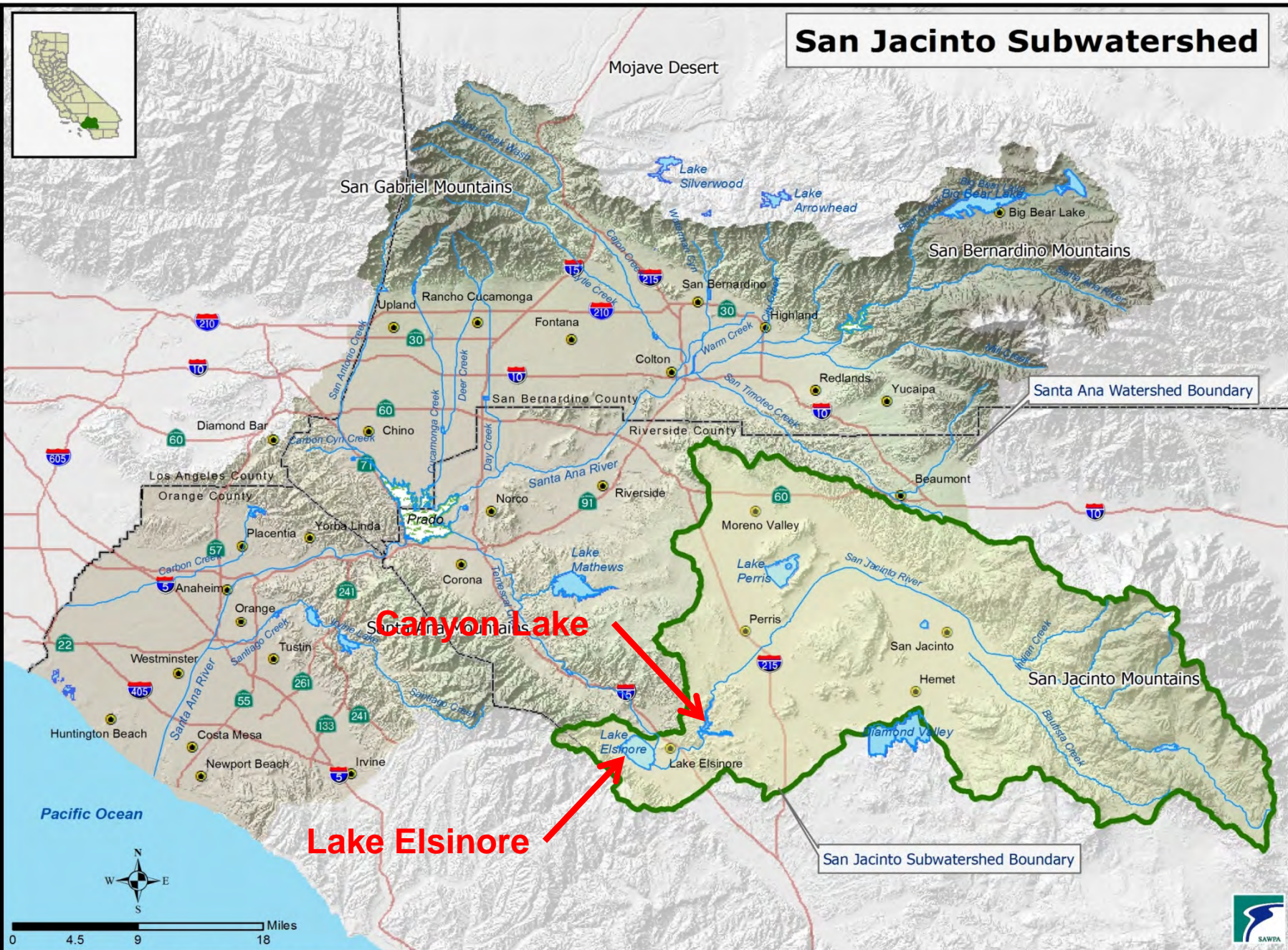


City of Lake Elsinore • City of Canyon Lake • County of Riverside  
Elsinore Valley Municipal Water District • Santa Ana Watershed Project Authority

# Lake Management by Watershed Approach

*Tom Evans, SAWPA Commissioner/  
LESJWA Director*

# San Jacinto Subwatershed

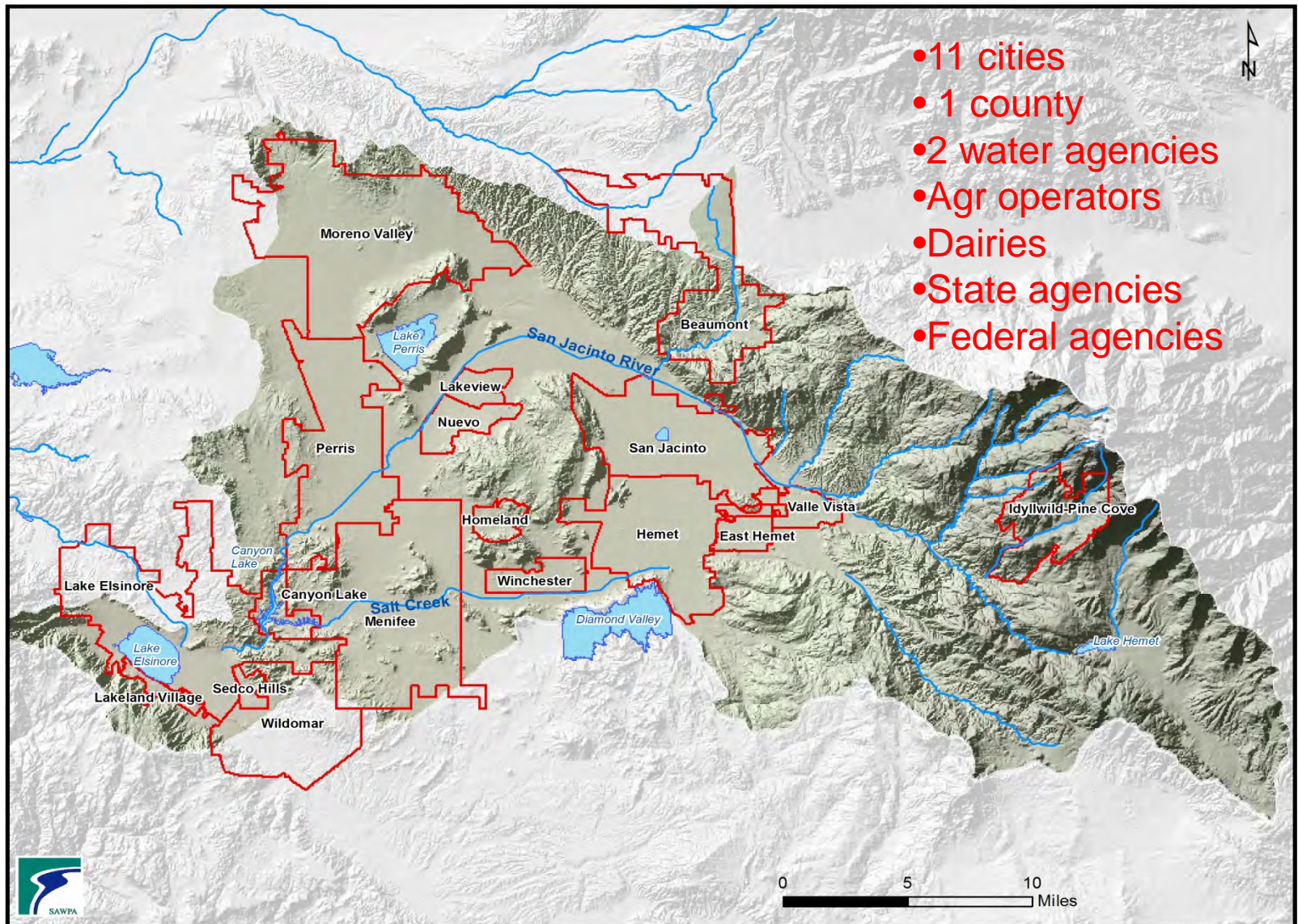


**Canyon Lake**

**Lake Elsinore**



# San Jacinto River Subwatershed



# In 2000, a new agency formed to restore Lake Elsinore, Canyon Lake and San Jacinto River Watershed



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# LESJWA Accomplishments –

## Based on Original Lake Elsinore Focus

Lake Elsinore Carp Removal

Lake Elsinore Island Wells Retrofit

Lake Elsinore Destratification System, Phase I  
(axial flow pumps for mixing)

Lake Elsinore Aeration System, Phase II  
(diffused perforated airlines for mixing)

Lake Elsinore Striped Bass Stocking

Phosphorus Removal at EVMWD Treatment  
Plant

Lake Elsinore Recycled Water Replenishment  
Pipeline - \$1.2 mil/yr water replacement

Lake Elsinore Back Basin Wetlands  
Enhancement

Canyon Lake East Bay Dredging

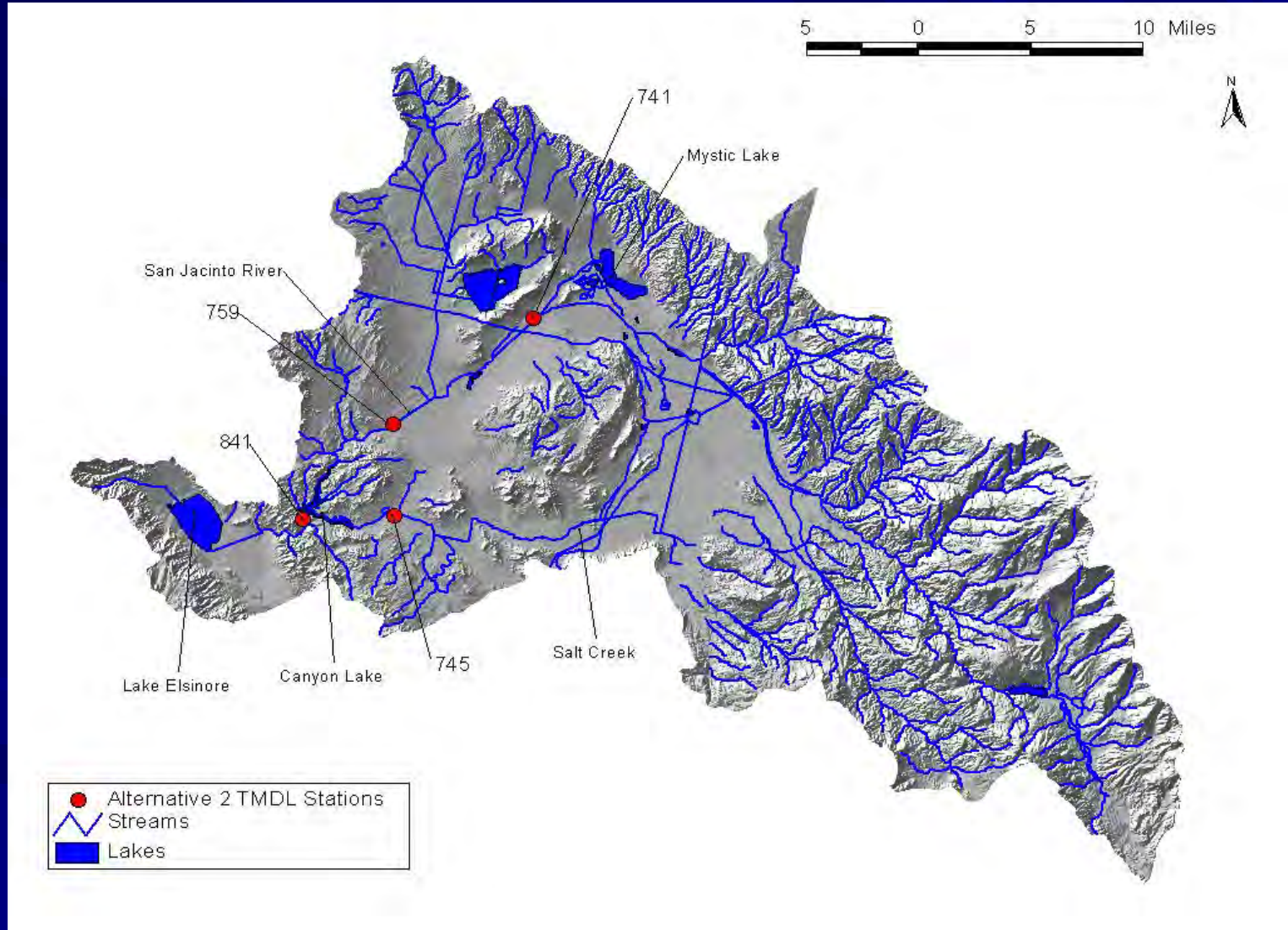


In 2006 Regional Board issued new water quality regulations (nutrient TMDLs) so a multi-agency Task Force was formed by LESJWA to support agencies who needed to meet new standards



<u>Indicator</u>	<u>Lake Elsinore</u>	<u>Canyon Lake</u>
<u>Total P concentration</u> Current = .15-.84 mg/L	0.1 mg/L by 2020	0.1 mg/L by 2020
<u>Total N concentration</u> Current = 0.11 – >5 mg/L	0.75 mg/L by 2020	0.75 mg/L by 2020
<u>Chlorophyll a conc.</u> Current = 49.5 – 219.7ug/L	25 ug/L by 2020	25 ug/L by 2020
<u>Dissolved oxygen conc.</u> Current = 3.61 – 11.56 mg/L	5 mg/L by 2020	5 mg/L by 2020

# Task Force conducts Lake and Watershed Runoff Monitoring and lake treatment alternatives



# Regional Board has provided active support to Task Force

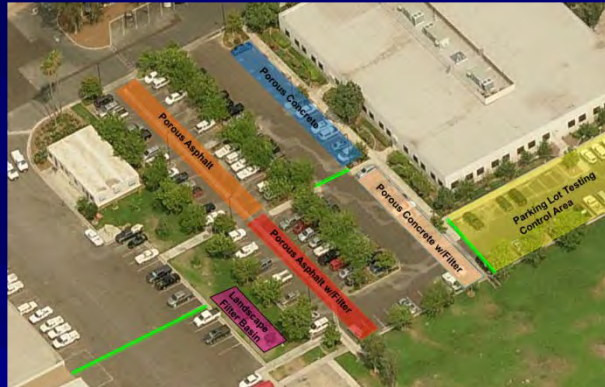




# Upper watershed permit holders – Must identify and Implement Feasible Watershed Based Controls



Illegal Discharge Investigations



Urban Retrofit Projects



New Development Controls



Education/Outreach



Street Sweeping



Business Inspection Programs

# VOLUME: The impediment to upper watershed compliance only

## The “BIG” Storm needs to be addressed

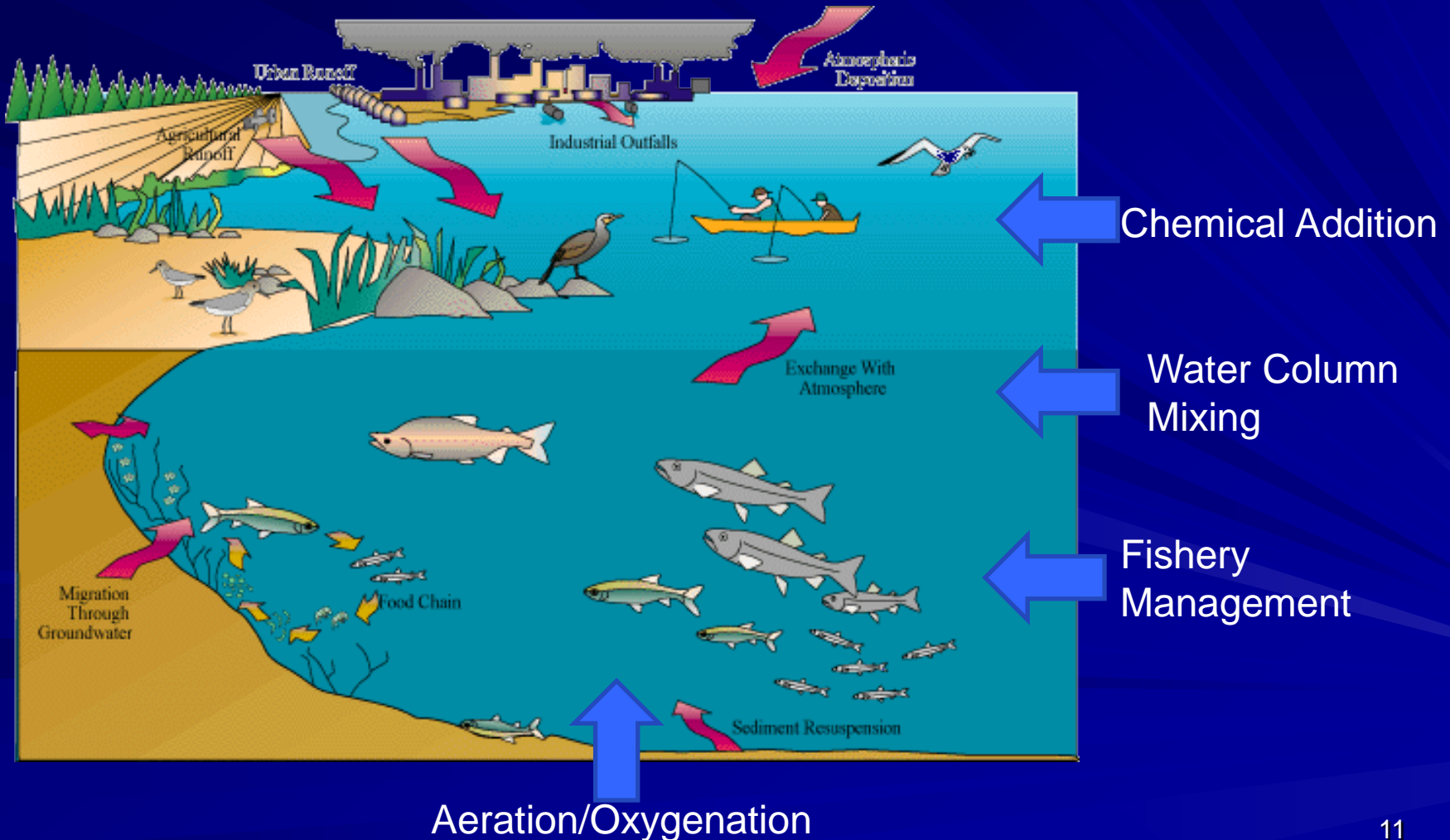


January 1993 – 10”/10 days

December 2010 – 7”/ 8 days

- Peak rainfall 3”/day
- Most of the problem nutrients arrive in these events
- Would require a minimum 4,000 acres set aside within urban area for treatment
- Equivalent to a “NEW” Lake Elsinore
- Billion dollar solution + O&M

# Alternative Option: In-Lake Treatment



# Future In-Lake Solutions = Greater Cost/Benefit

In-Lake	Capital Costs (estimated)	Annual Operation Costs (estimated)
<b>Canyon Lake</b>		
Chemical Nutrient Binders e.g. alum addition	N/A	\$300,000
Hypolimnetic Oxygenation System (if needed)	\$2-4 million	\$250,000
<b>Lake Elsinore</b>		
Lake Elsinore Aeration, Mixing, Fish Management	N/A	\$500,000
Lake Water Addition	N/A	\$1,500,000

Compared to upper watershed control of nutrients from “big” storms:

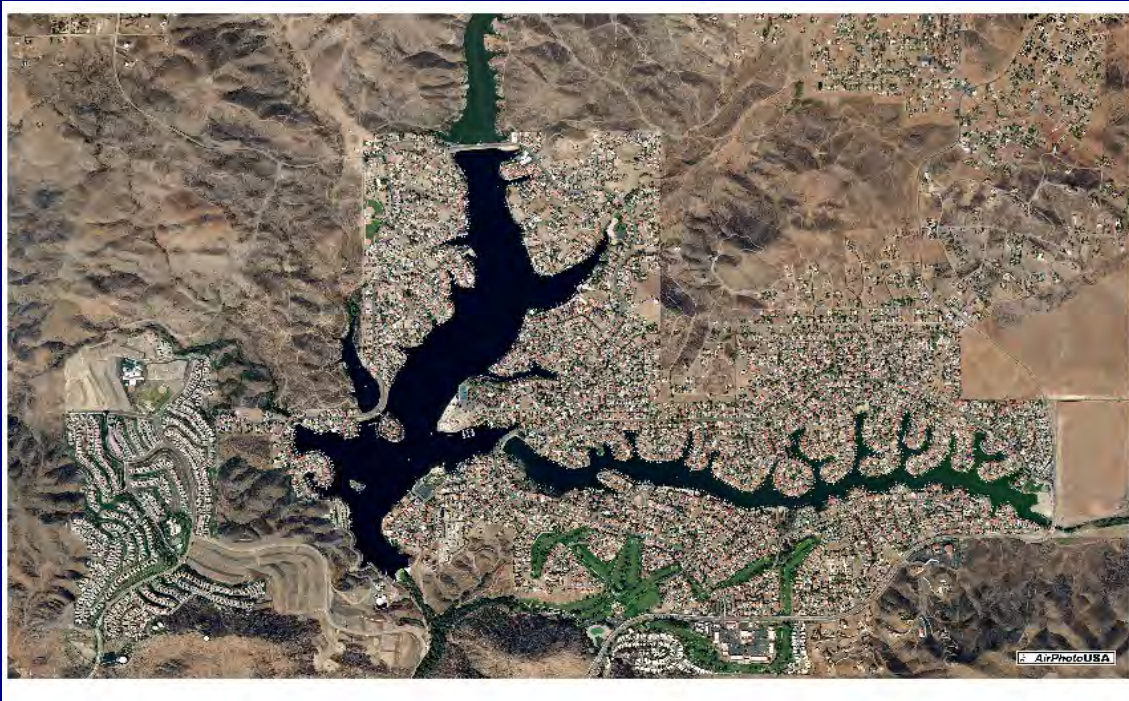
**\$1 Billion (?)**

**\$ millions (?)**

# Canyon Lake TMDL - Potential Projects

## Options considered

- Hypolimnetic Oxygenation System ←
- Alum (common water treatment addition) →
- Floating Islands
- Dredging



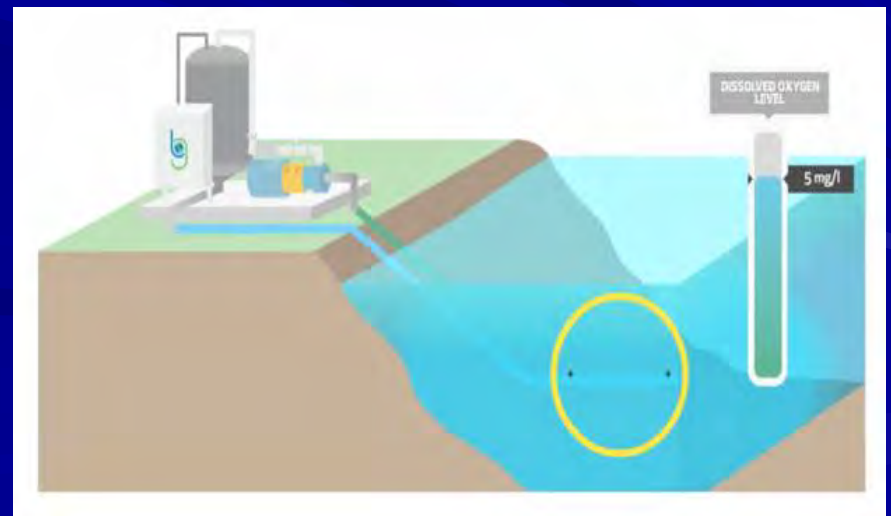
# Canyon Lake – Adaptive Management Approach



Canyon Lake Alum Application –  
Two times per year over 2 ½ years  
- \$750,000 to reduce phosphorus  
and algae growth in lake.

If oxygen levels still not high  
enough after lake alum, then

Canyon Lake Hypolimnetic  
Oxygenation System – up  
to \$2.8 million capital and  
\$130,000/yr O&M may be  
necessary



# Prop 84 IRWM Round 2 Grant- \$500,000 will help cover much of the alum application costs



Grant Writing Support



Questions?