

Lake Elsinore & San Jacinto Watersheds Authority



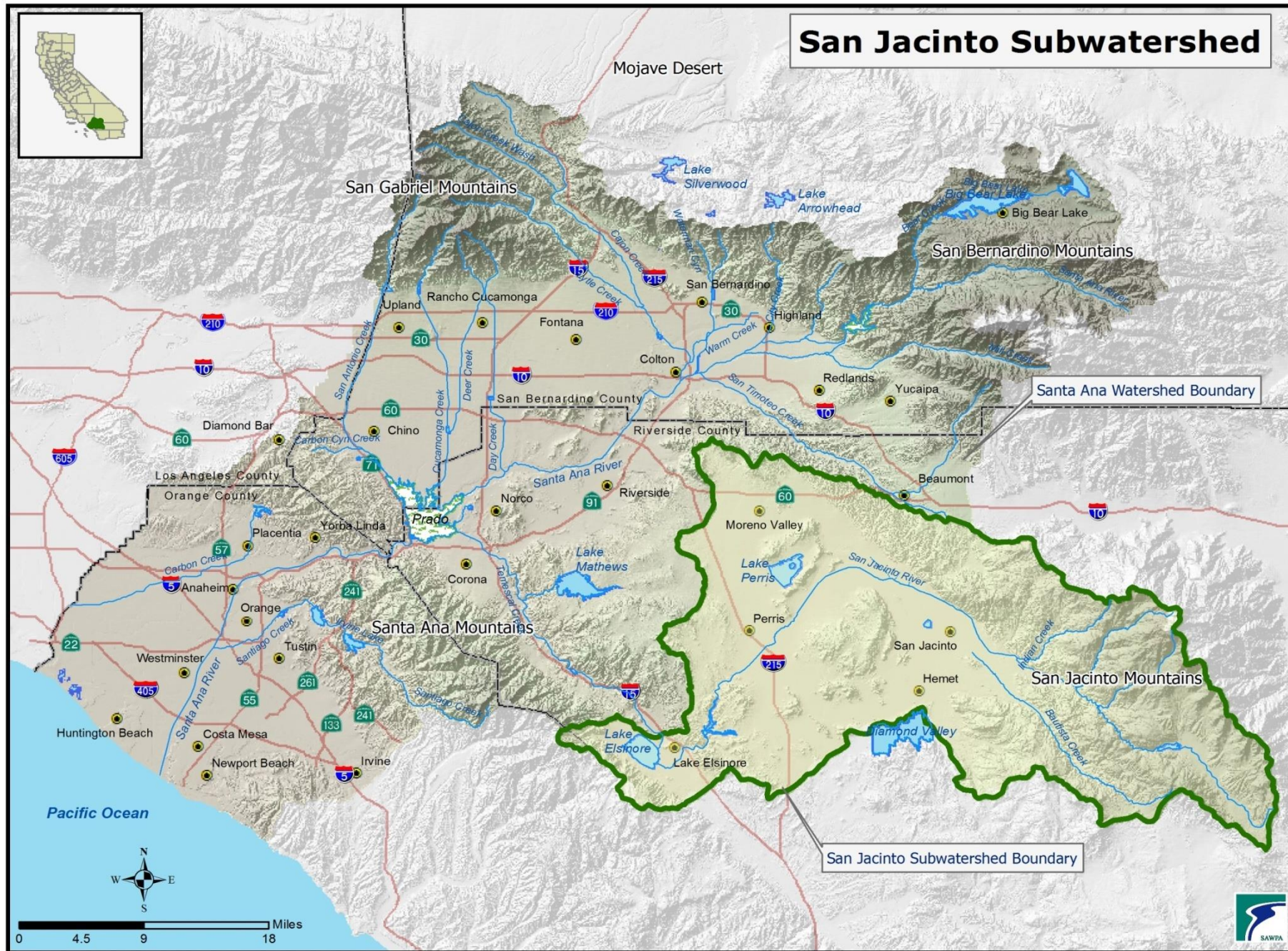
City of Lake Elsinore • City of Canyon Lake • County of Riverside
Elsinore Valley Municipal Water District • Santa Ana Watershed Project Authority

Mark R. Norton PE, LEED AP

Water Resources & Planning Mgr
Santa Ana Watershed Project Authority
Authority Administrator, LESJWA

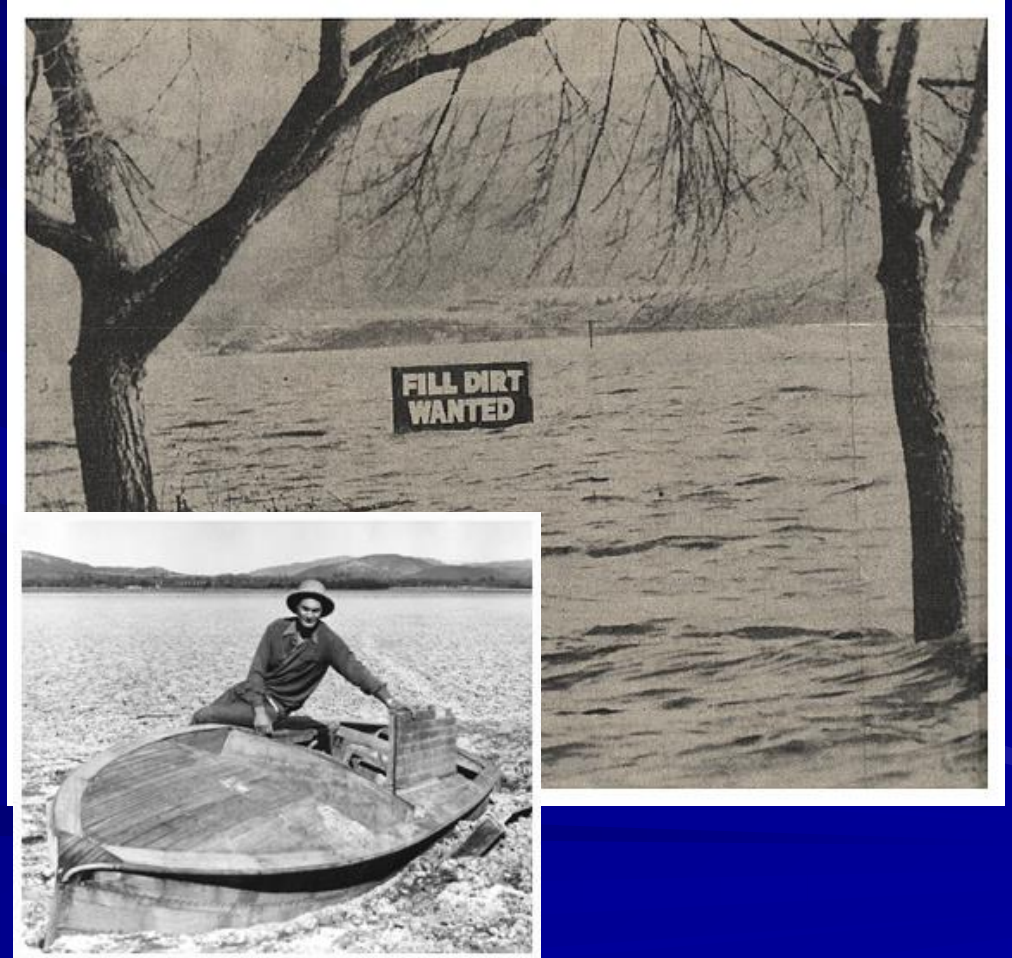


San Jacinto Subwatershed



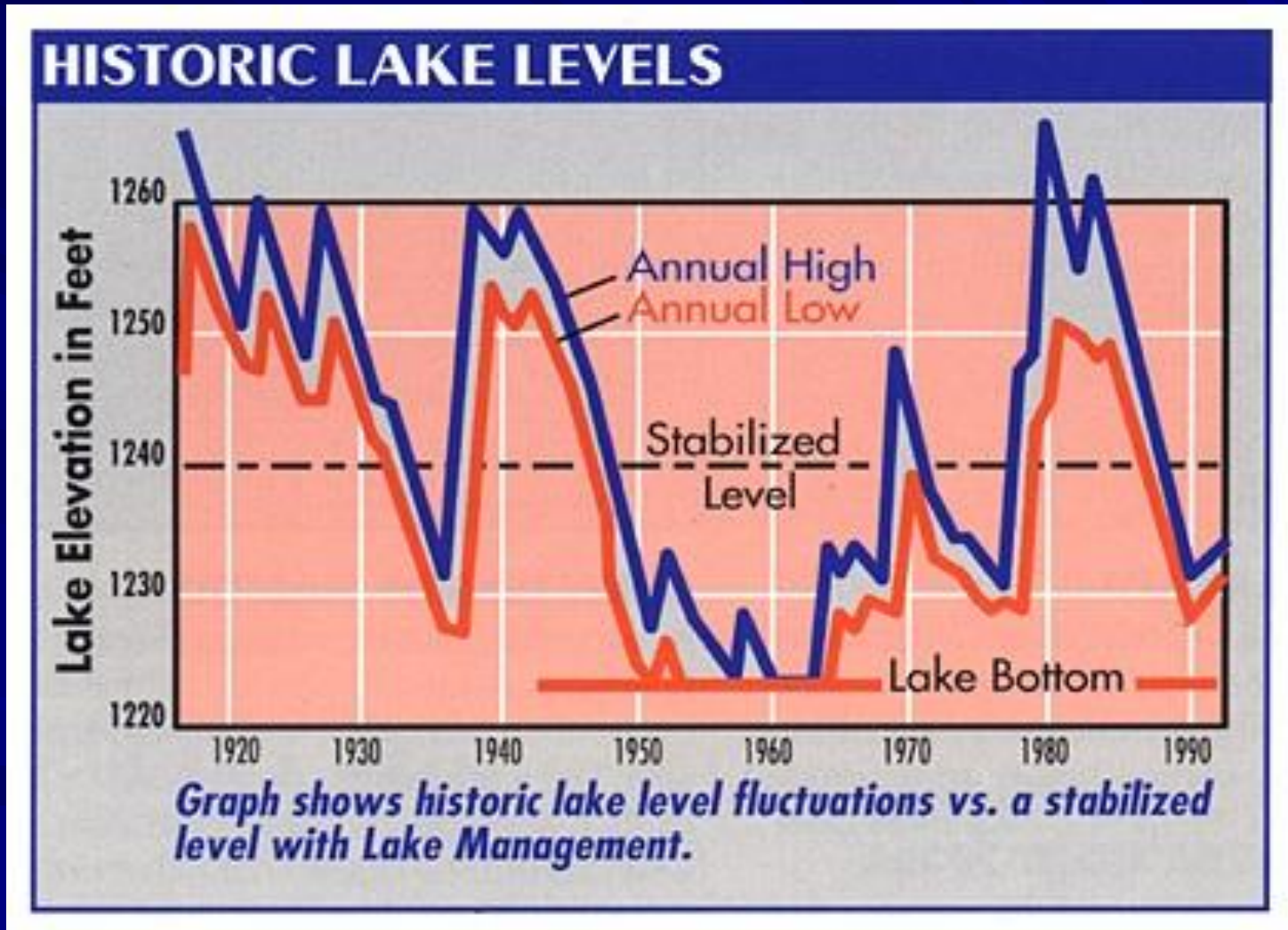
Lake Elsinore - History Ups & Downs

■ Lake Elsinore has a history of flooding... and drying*



* The lake has spilled 7 times in the past 85 years and has gone dry twice

Historic Lake Levels & Events



Lake evaporation drops lake level about 4 ½ feet each year



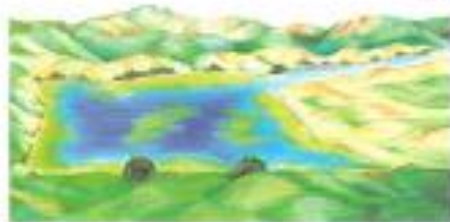
**That's enough
water to fill
this 8 million
gallon tank
every day**

Watershed runoff impacts to lakes

Fish Kills: An imbalance in nature caused by four regularly occurring conditions including watersheds, weather/lake levels, carp and algae results in fish kills.



Watersheds: Unwanted natural substances become part of the water as it travels through the watershed and increases algae levels that lead to fish kills.



Algae: Algae production lowers the oxygen level in the water that fish need to survive and leads to fish kills.



Weather and Lake Levels: Low and high lake levels also increase algae levels that lead to fish kills.

Fish Kill Cycle



Carp: Carp stirs up nutrients from the lake bottom, which increases algae levels that lead to fish kills.

Historical Water Quality Problems

Excessive nutrient input at Lake Elsinore

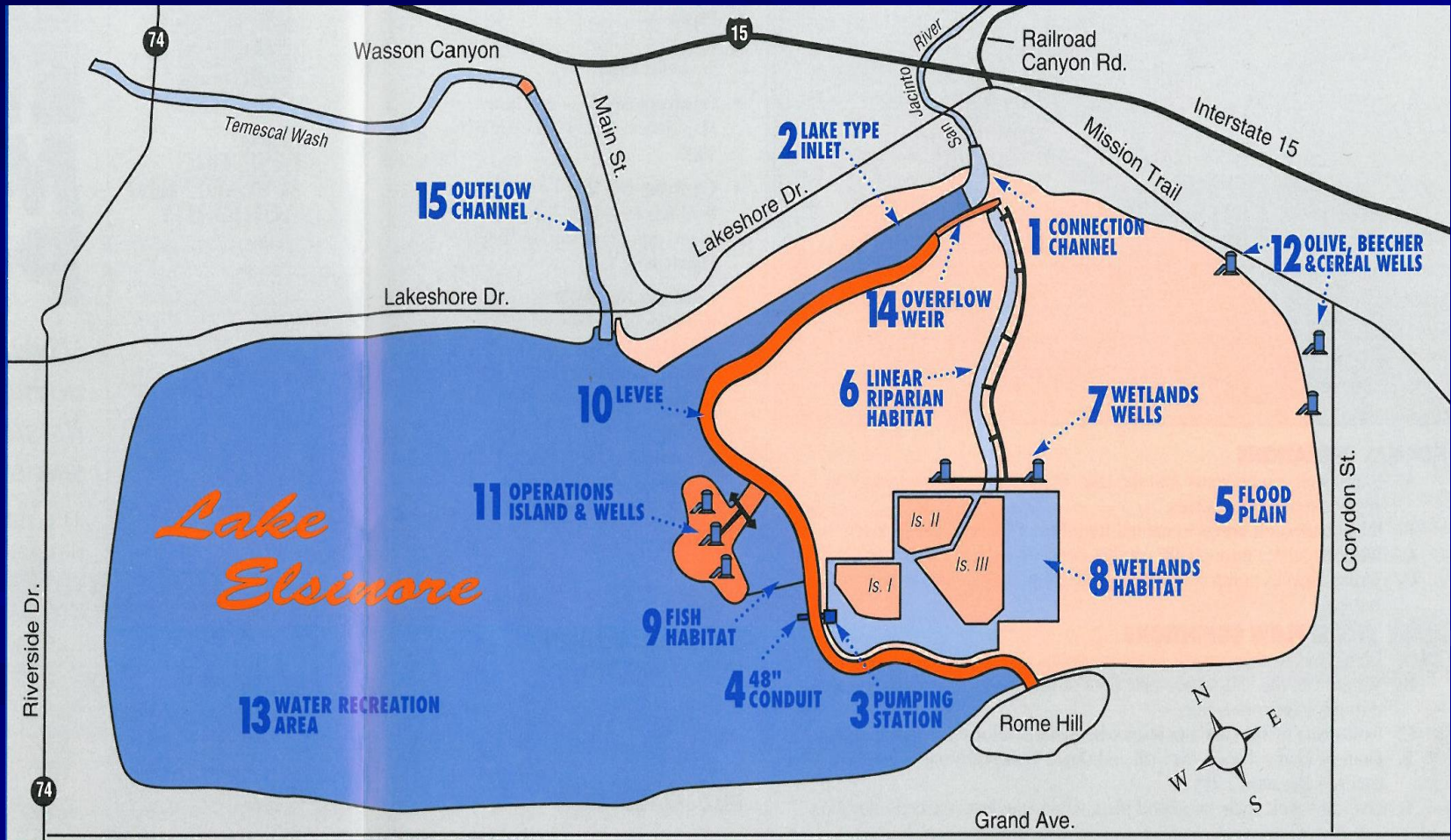
Algal Blooms - mostly blue-green
Depressed Oxygen Levels
Fish Kills



Lake Elsinore – Low lake levels are a major factor in fish die-offs



Lake Elsinore Management Project – Early Goal of A Stabilized Lake



Lake Elsinore Management Authority (LEMA) Formed



U.S. Bureau of Reclamation Grant and Loan	\$26 million
Local contributions	<u>\$13.6 million</u>
Total	\$39.6 million



Lake Elsinore Management Project is completed by 1995



In 2000, a new agency formed to restore Lake Elsinore



Carp Removal

Annual Carp Removal until terminated in 2010 when fishery balance achieved



Removed over 1.1 million pounds of carp from Lake Elsinore

ISLAND WELL IMPROVEMENTS & WETLANDS PIPELINE



**16" – 1 mile Wetlands Pipeline
Completed March 2005**

Island Well Retrofits

Completed June 2003

**Produces 1.2 billion gallons of
water annually for Lake Elsinore
lake level stabilization**

Operated by EVMWD



Experimental Striped Bass Stocking

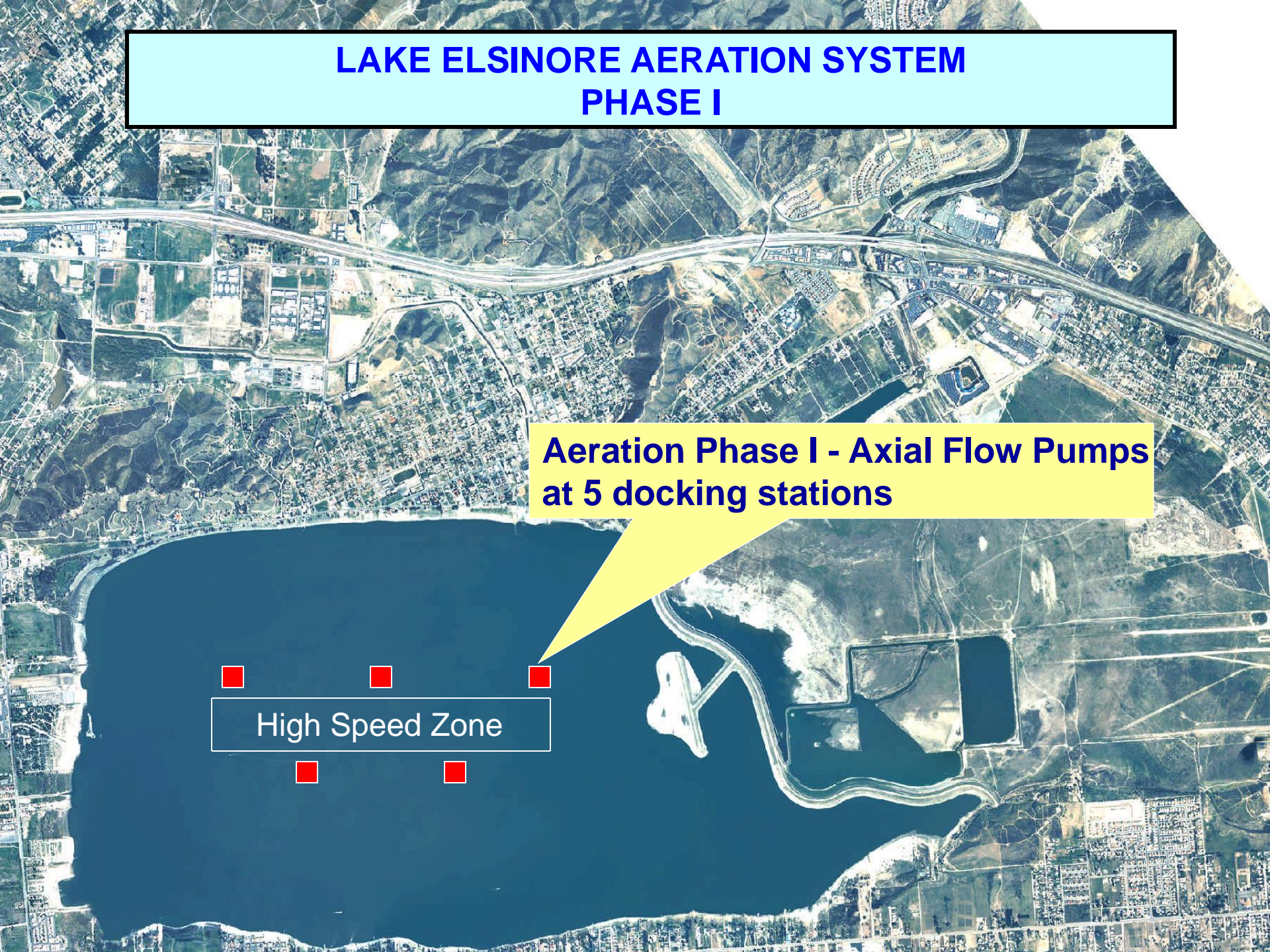
26,500 hybrid striped bass stocked in Lake – feed on carp fingerlings and shad



LAKE ELSINORE AERATION SYSTEM PHASE I

**Aeration Phase I - Axial Flow Pumps
at 5 docking stations**

High Speed Zone



Lake Elsinore Destratification System, Aeration Phase 1

Mixes high oxygen near surface down to lower lake depths

Completed July 2004 -
Operates primarily
during warm season
months

O&M funded by City of
L.E., EVMWD and
County

Operated by City of L.E.



LAKE ELSINORE AERATION SYSTEM PHASE II

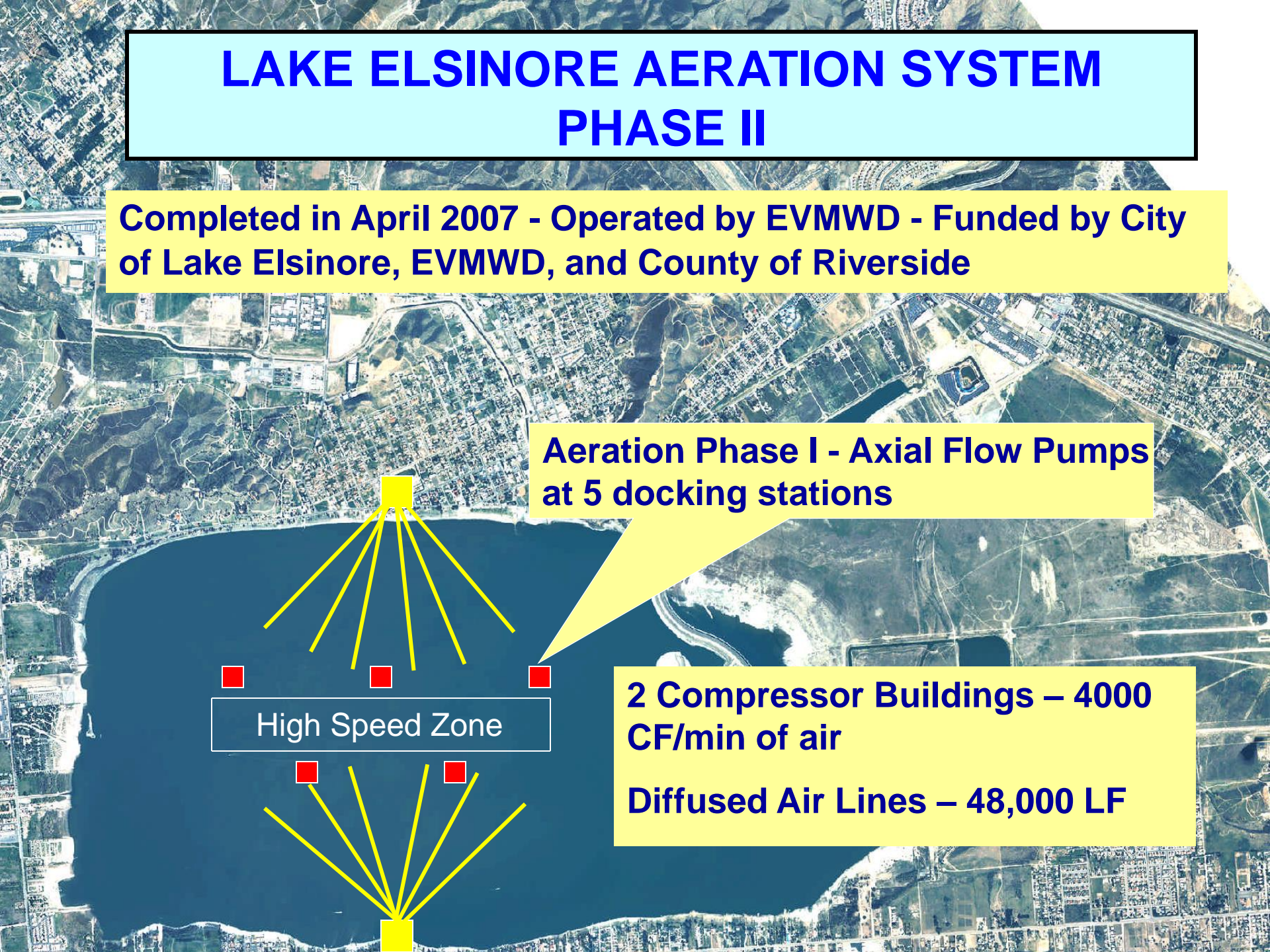
Completed in April 2007 - Operated by EVMWD - Funded by City of Lake Elsinore, EVMWD, and County of Riverside

Aeration Phase I - Axial Flow Pumps
at 5 docking stations

High Speed Zone

2 Compressor Buildings – 4000
CF/min of air

Diffused Air Lines – 48,000 LF





Phosphorus Removal Treatment at EVMWD Plant



Recycled water pipeline from EVMWD treatment plant to Lake Elsinore to help maintain water levels

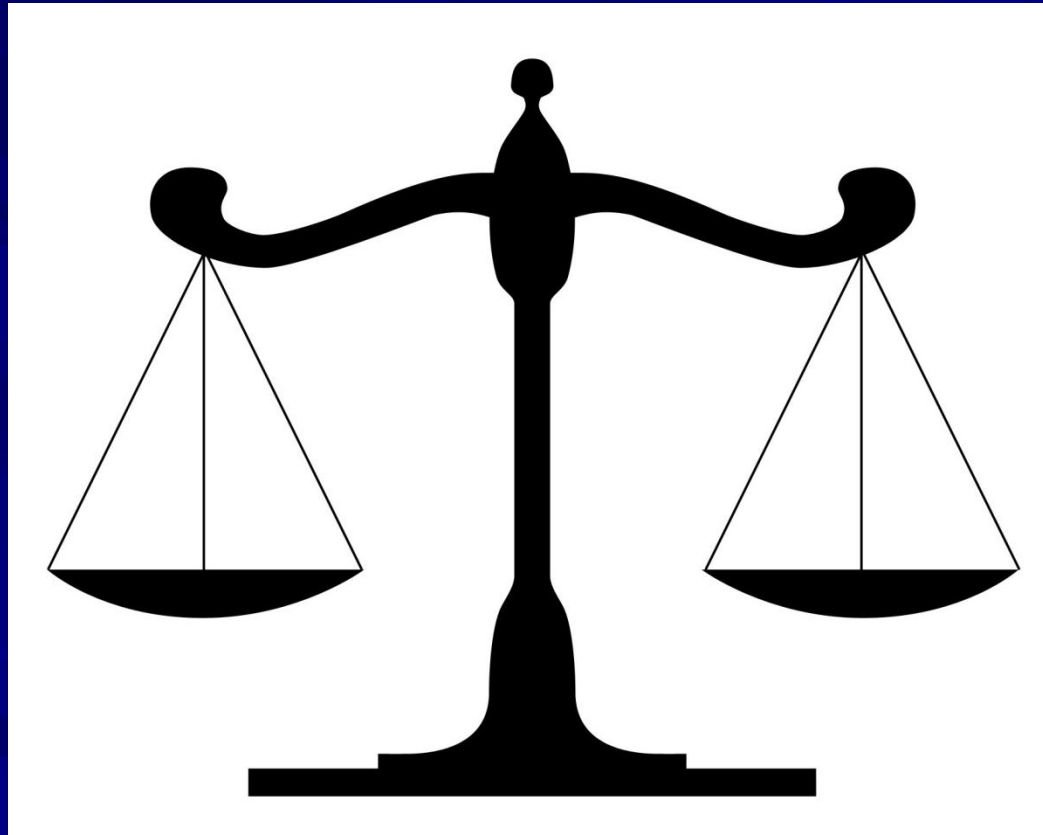


Canyon Lake Improvements – 20,000 CY Sediment Removal in East Bay



LESJWA's New Mission Statement Lake Elsinore Focus

Canyon
Lake



Lake
Elsinore

LESJWA Benefits

- Local Governance composed of many TMDL Task Force members
- Mutual goals as TMDL Task Force
- Contracting and financial entity for all Task Force consultants and monitoring support
- Implementing agency for lake improvements
- Successful grant application support
- Positive relationship with Regional Board
- LESJWA has stable revenue and sustainable for foreseeable future



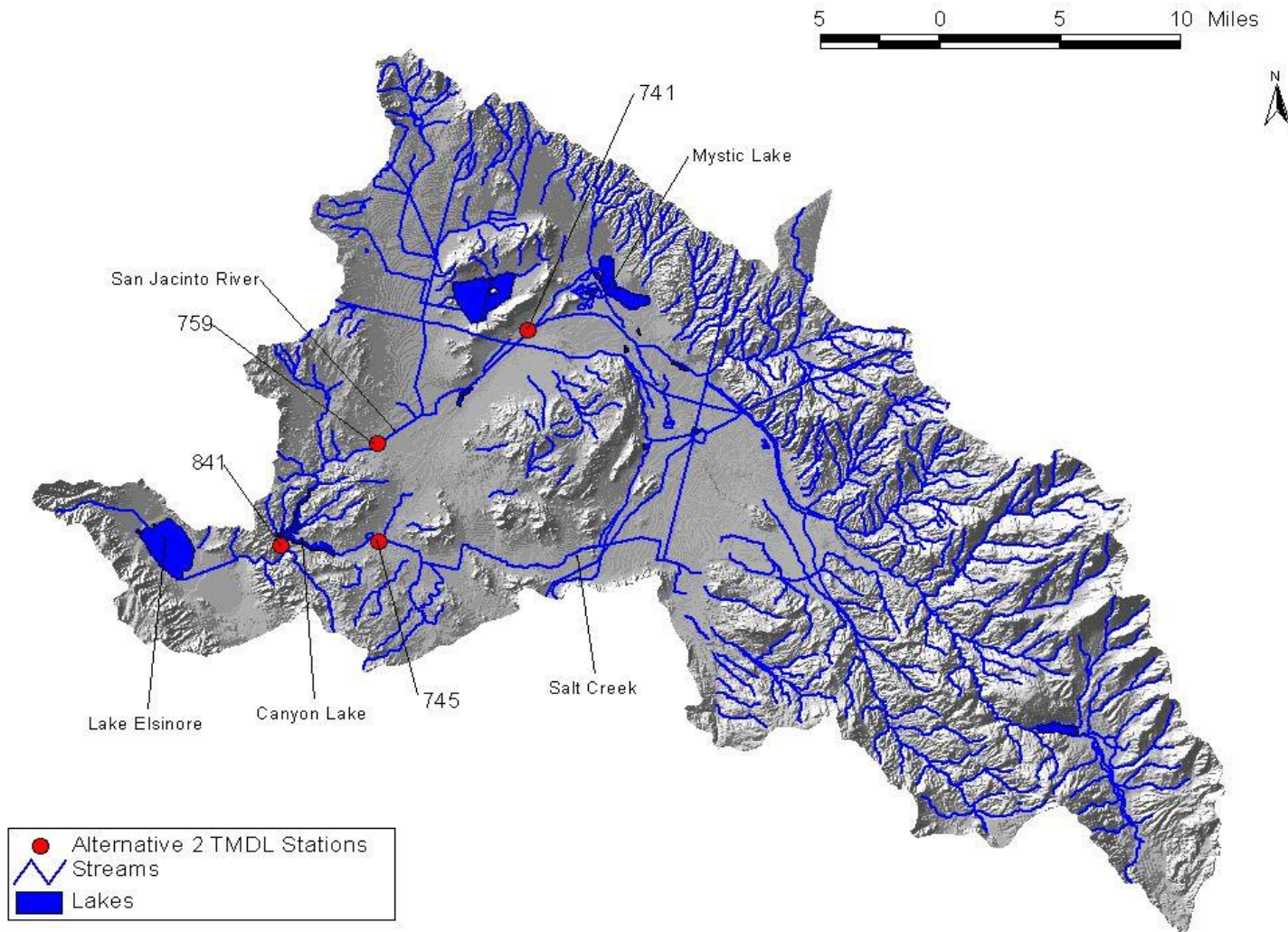
TMDL Task Force Agreement signed by 23 orgs in 2006



Enid was finally ready to admit that compliance was a bit more complicated than she first thought.



Task Force conducts Lake and Watershed Runoff Monitoring



Latest LESJWA Projects - Canyon Lake Alum Application

Canyon Lake Alum Treatment

Initial Treatment Period:

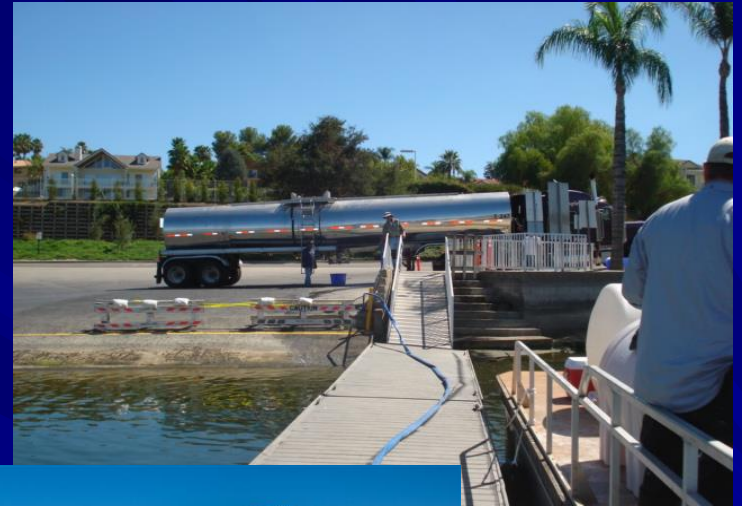
- Five Dosing Events

- Fall Event

(approximately 77,000 gal liquid
or 190,000 kg dry alum)

- Spring Event

(approximately 50,000 gal liquid
or 120,000 kg dry alum)



Alum Delivery: Main Body Canyon Lake

September 2013 – 2015



Alum Delivery & Dispersion Along Shore and Boat Docks: Main Body Canyon Lake Sep 2013 - 2015



TMDL Compliance Through Collaboration



Questions?

What more is needed for Lake Elsinore to comply with TMDL?



More recycled water
and nonpotable well
water

Balanced Fishery – More Fish
Stocking & Carp Removal?

Continued Lake Aeration

