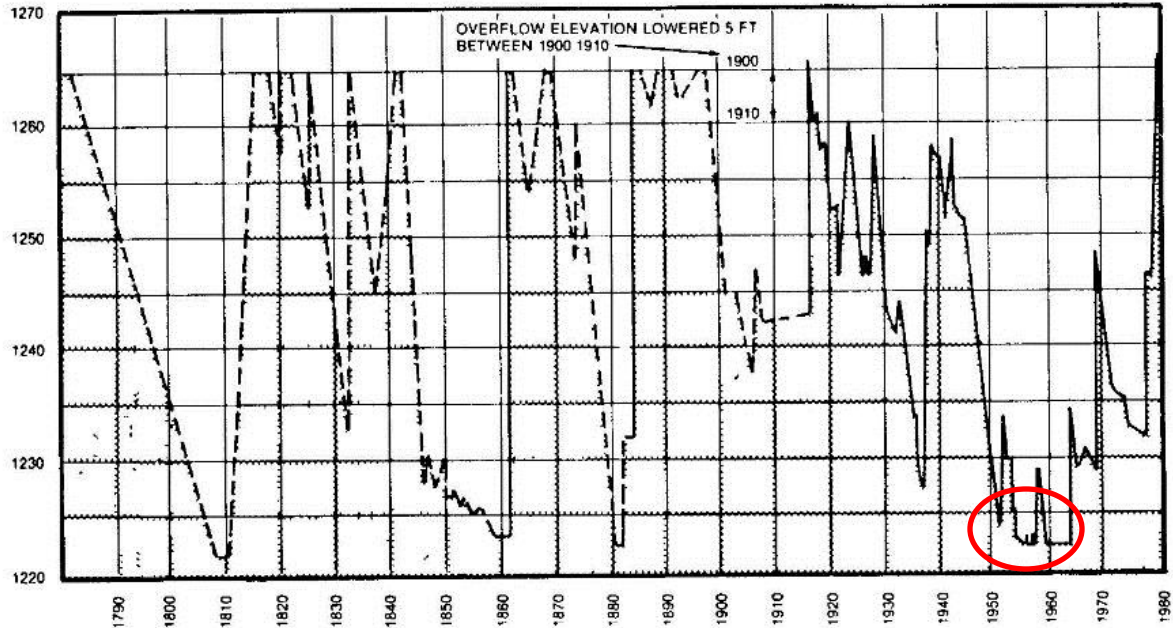


Lake Elsinore: 1770-1980



← Data from historical accounts and rainfall correlation—M W D report by Lynch. Revised by R C F C and W C D due to records found in old diaries 1842 1859

* Data from lawsuits and maps in M W D report by Lynch. Revised by R C F C and W C D due to records found in old diaries 1875 1884

* Data from USGS records 1915 1916

* Data from State Park Ranger

NOTE Solid lines show reported elevation
Broken lines show interpolated elevation

LAKE ELSINORE,
RIVERSIDE COUNTY

HISTORIC LAKE LEVEL
SINCE 1774

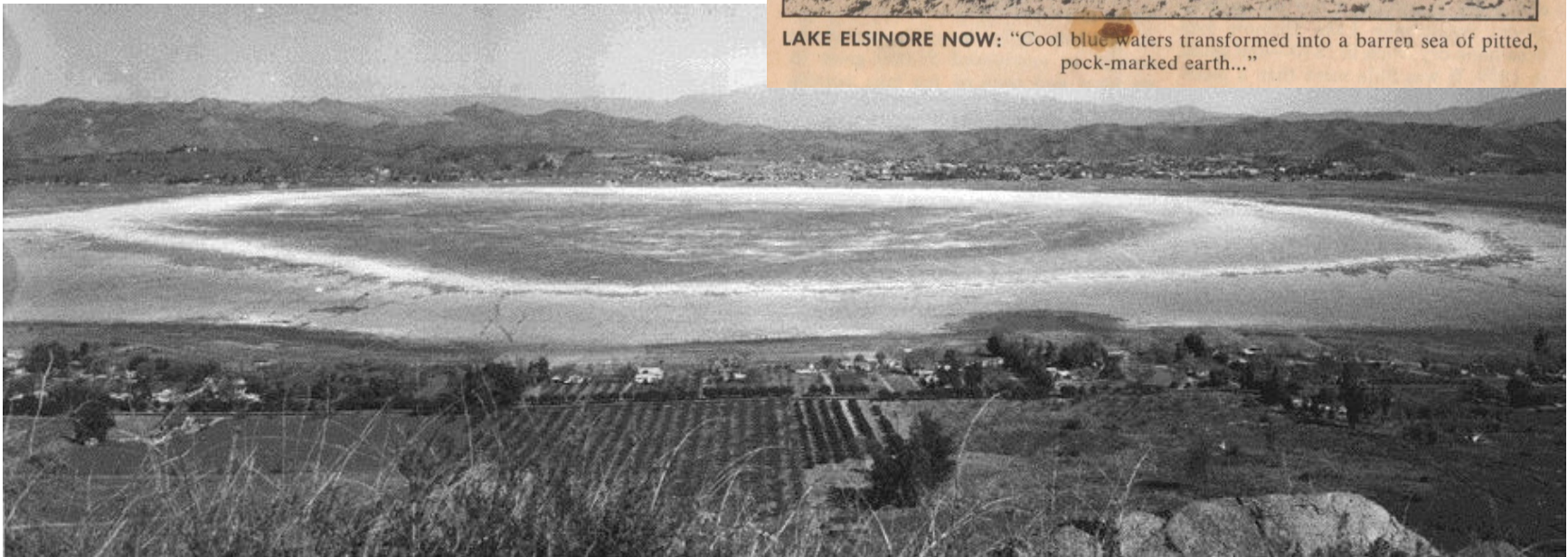
U S ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Lake Elsinore

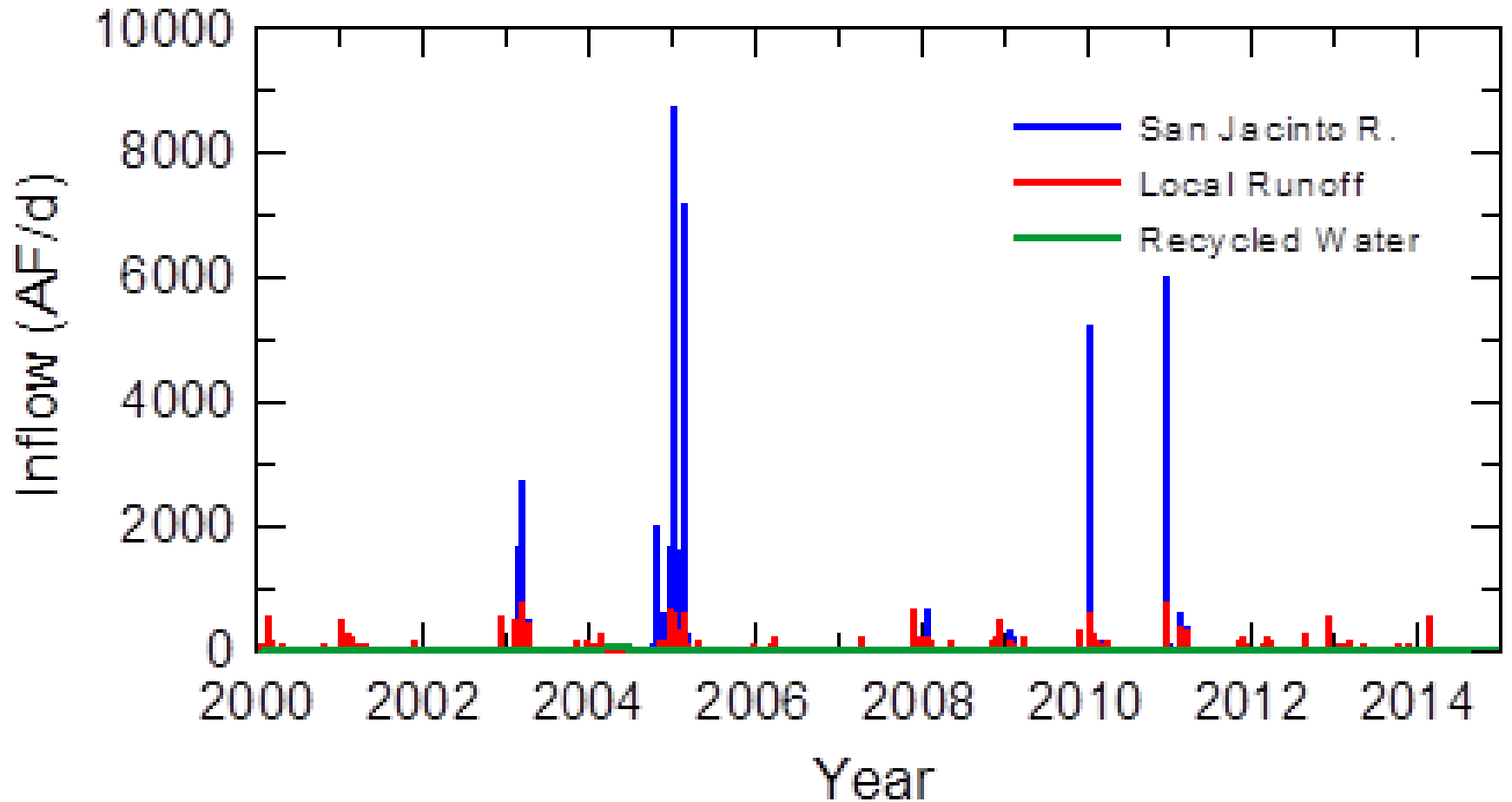
1950 - 1964



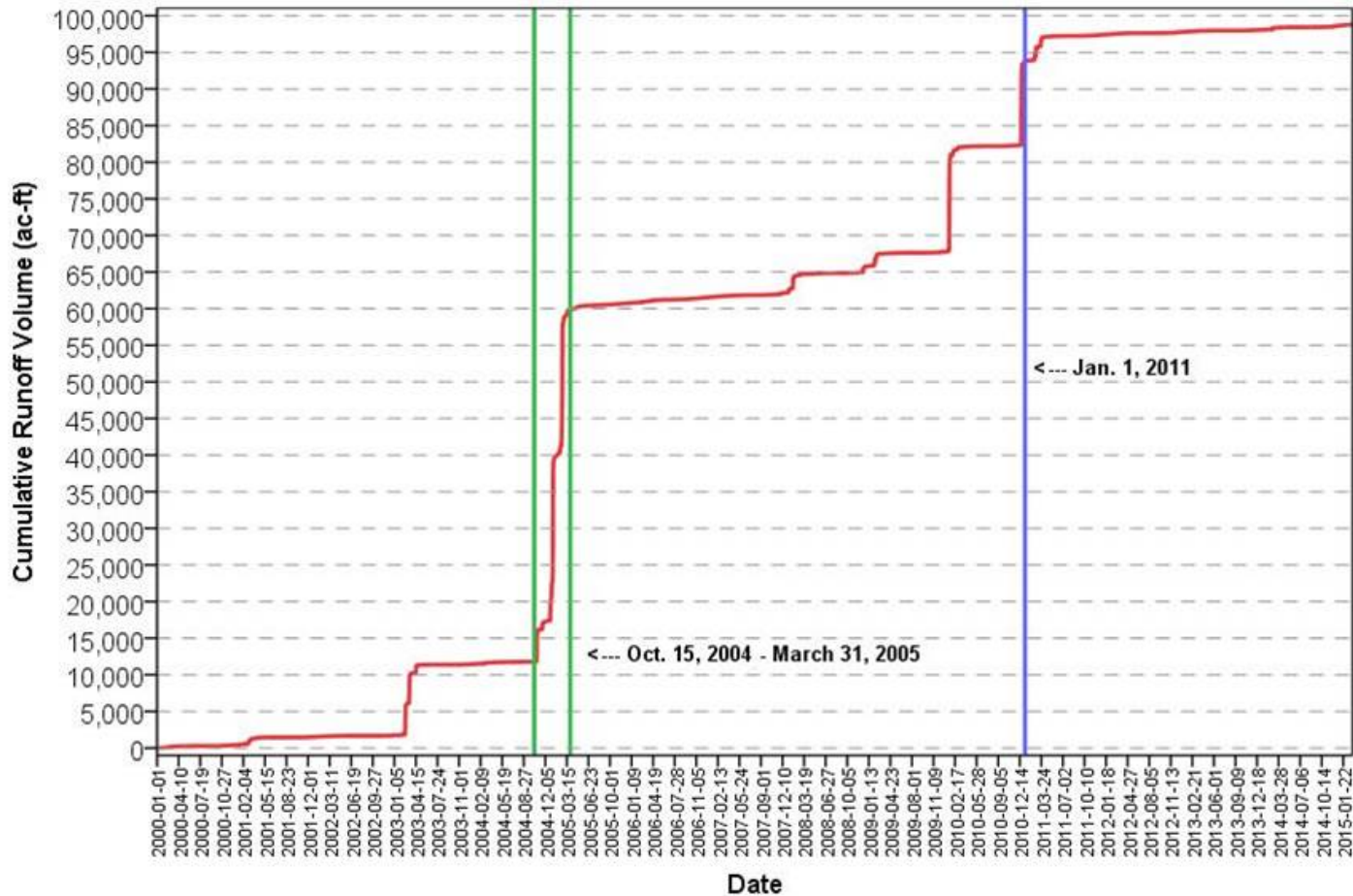
LAKE ELSINORE NOW: "Cool blue waters transformed into a barren sea of pitted, pock-marked earth..."



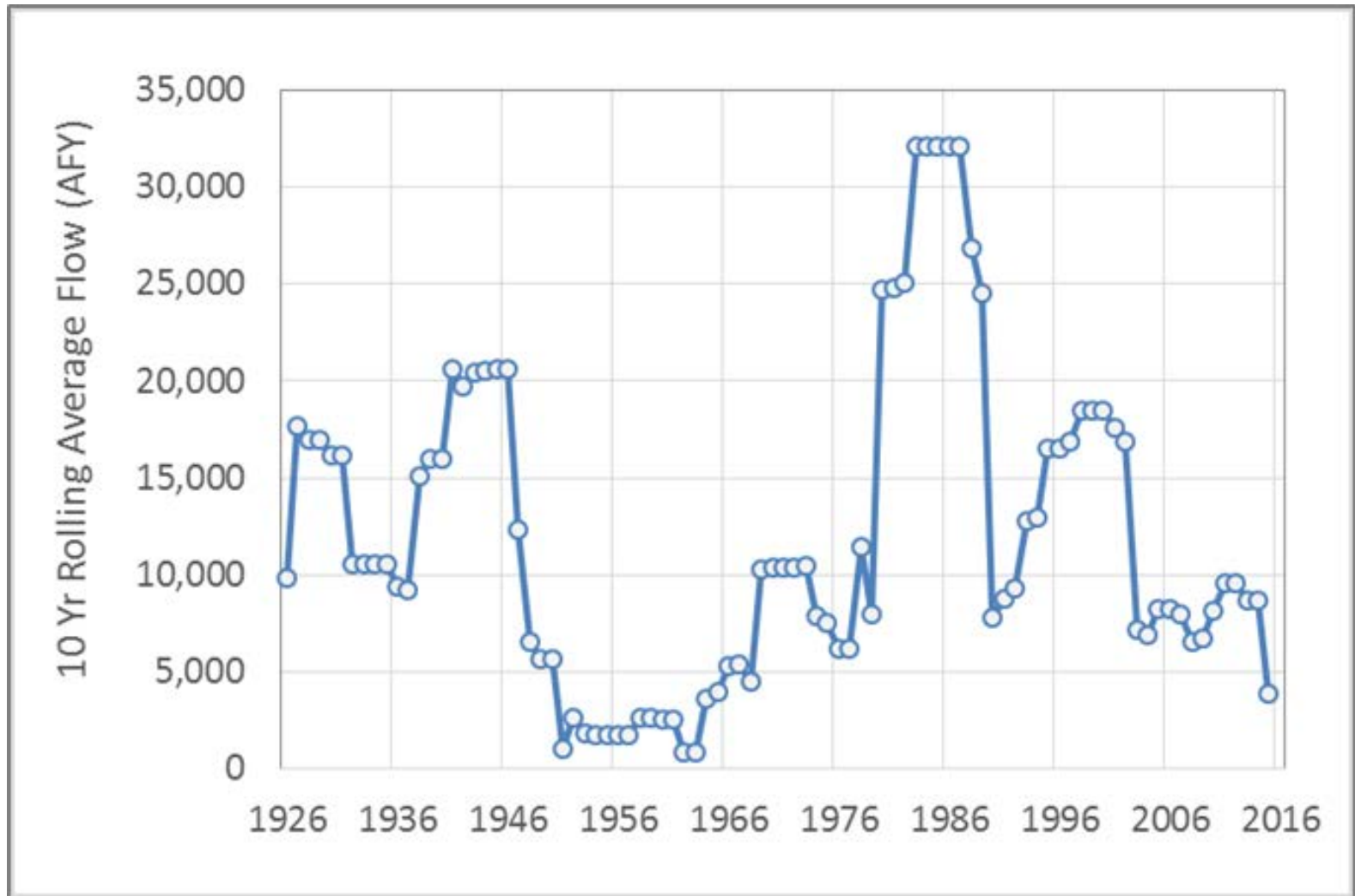
Runoff to Lk. Elsinore (2000-2014)



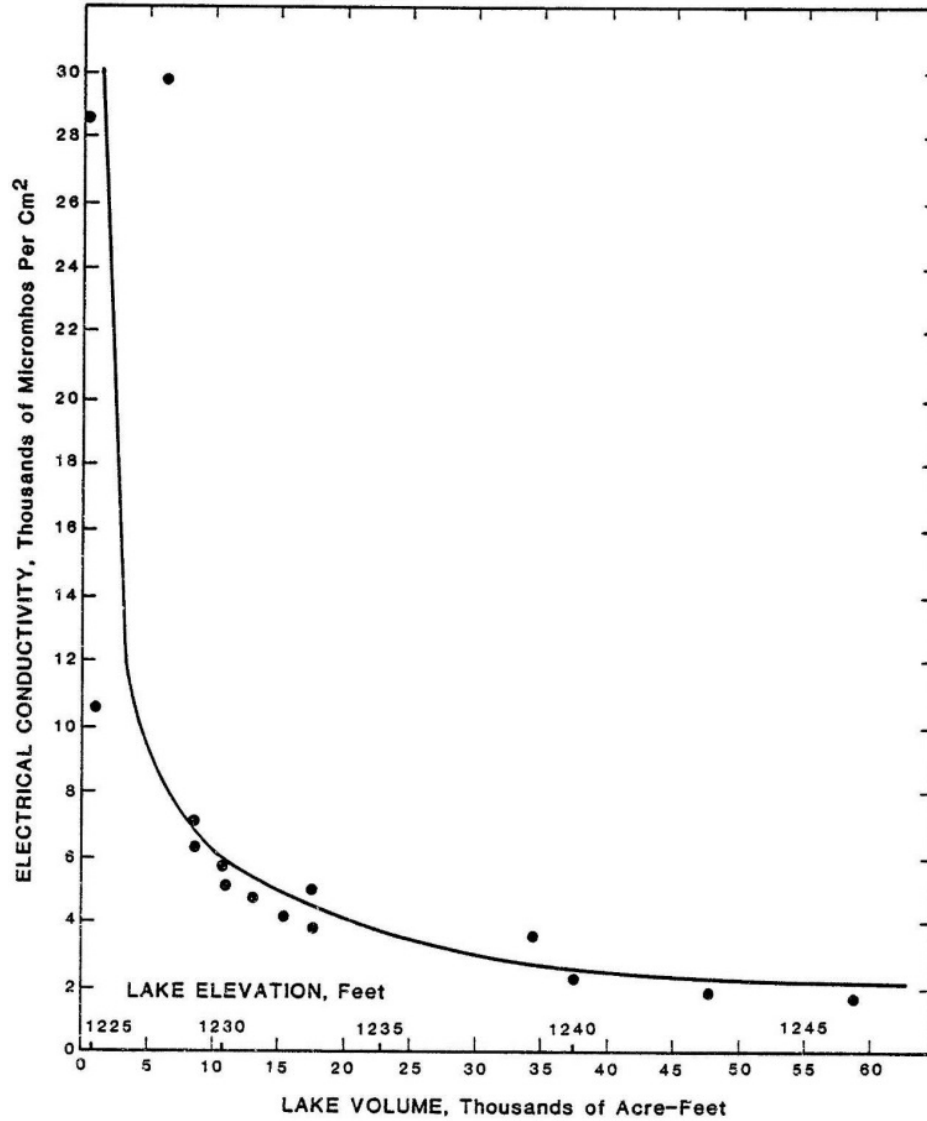
Runoff to Lk. Elsinore (2000-2014)



Runoff to Lk. Elsinore (1926–2016)

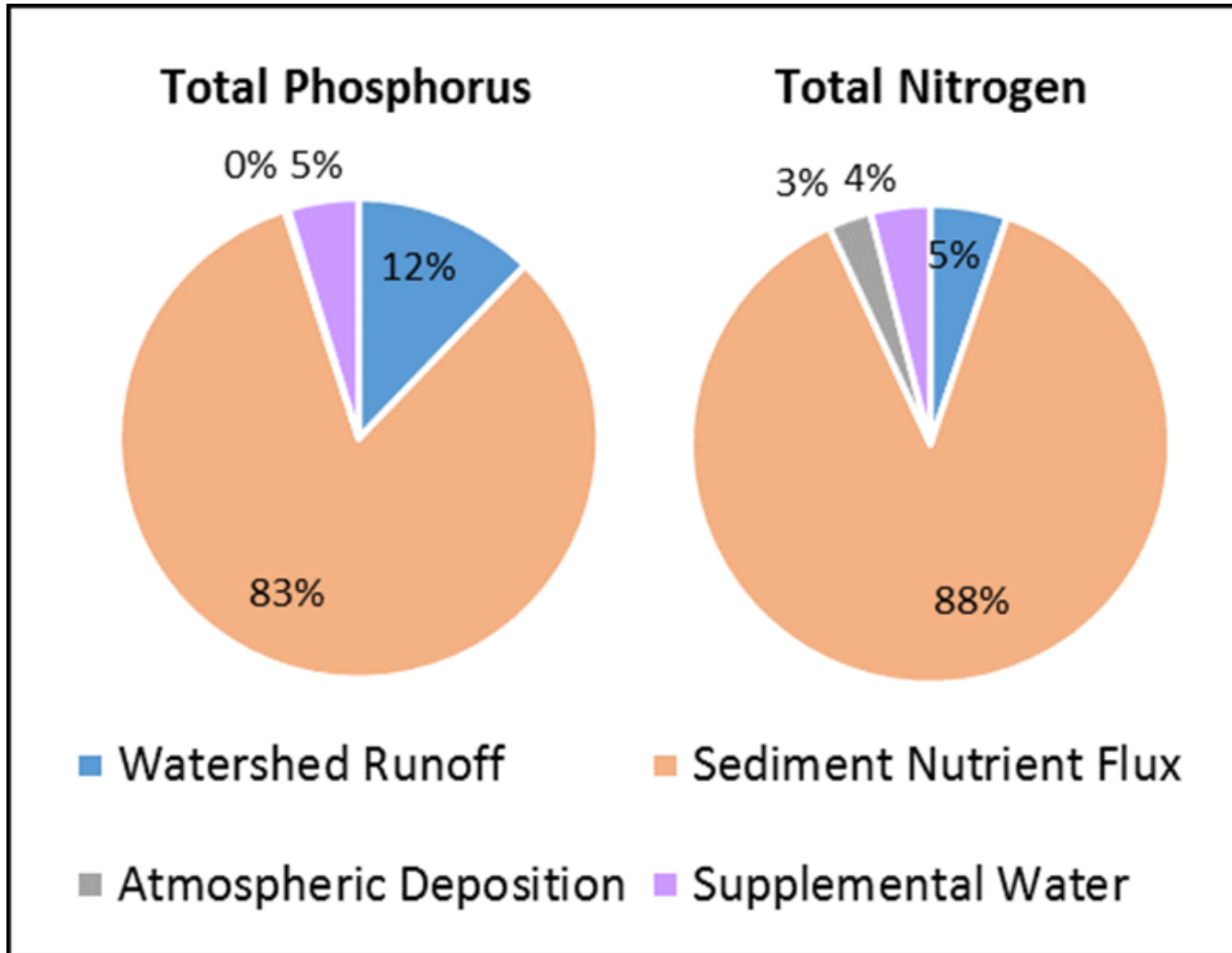


WATER CONDUCTIVITY AS A FUNCTION OF LAKE VOLUME AND LAKE LEVEL

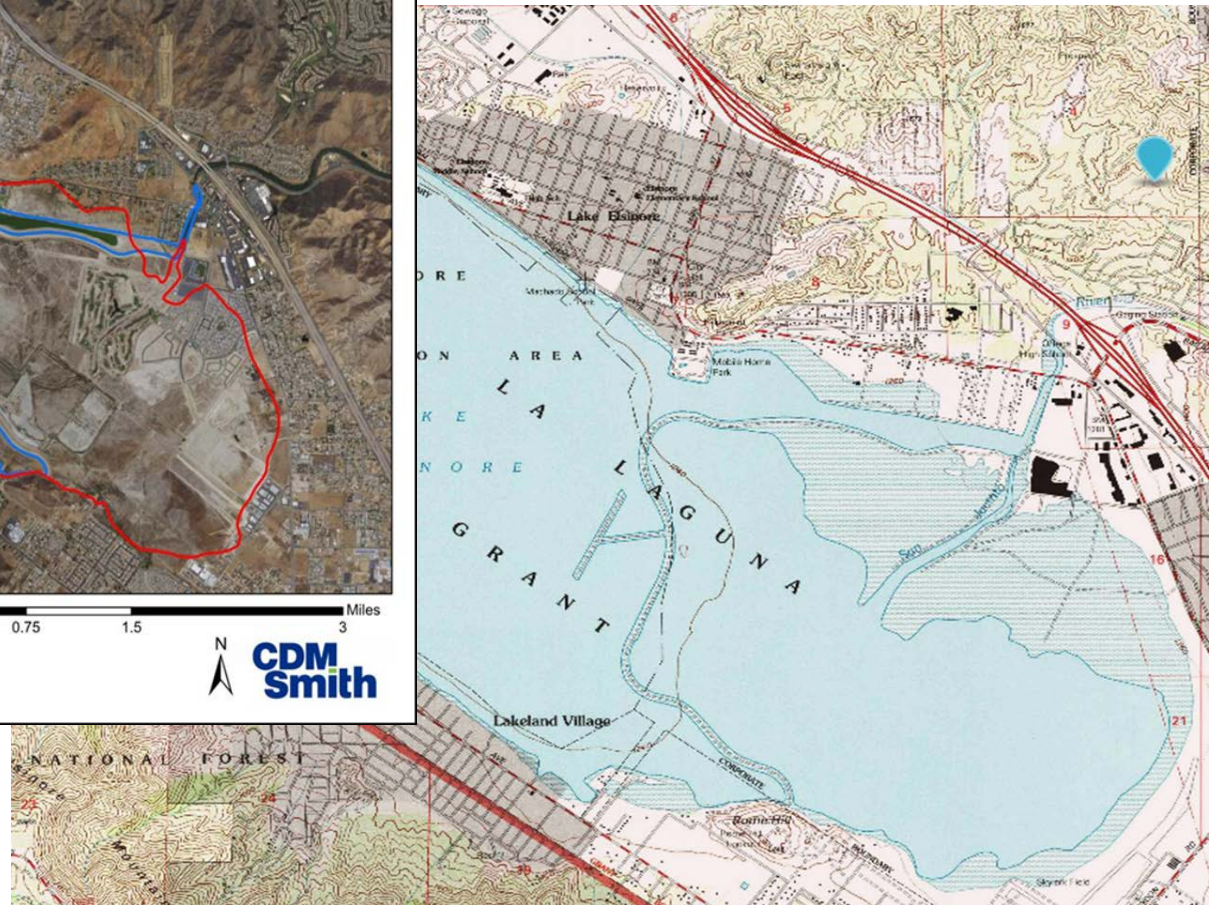


SOURCE OF DATA: FILES REGIONAL WATER QUALITY CONTROL BOARD (SANTA ANA)

Nutrient Loads to Lake Elsinore

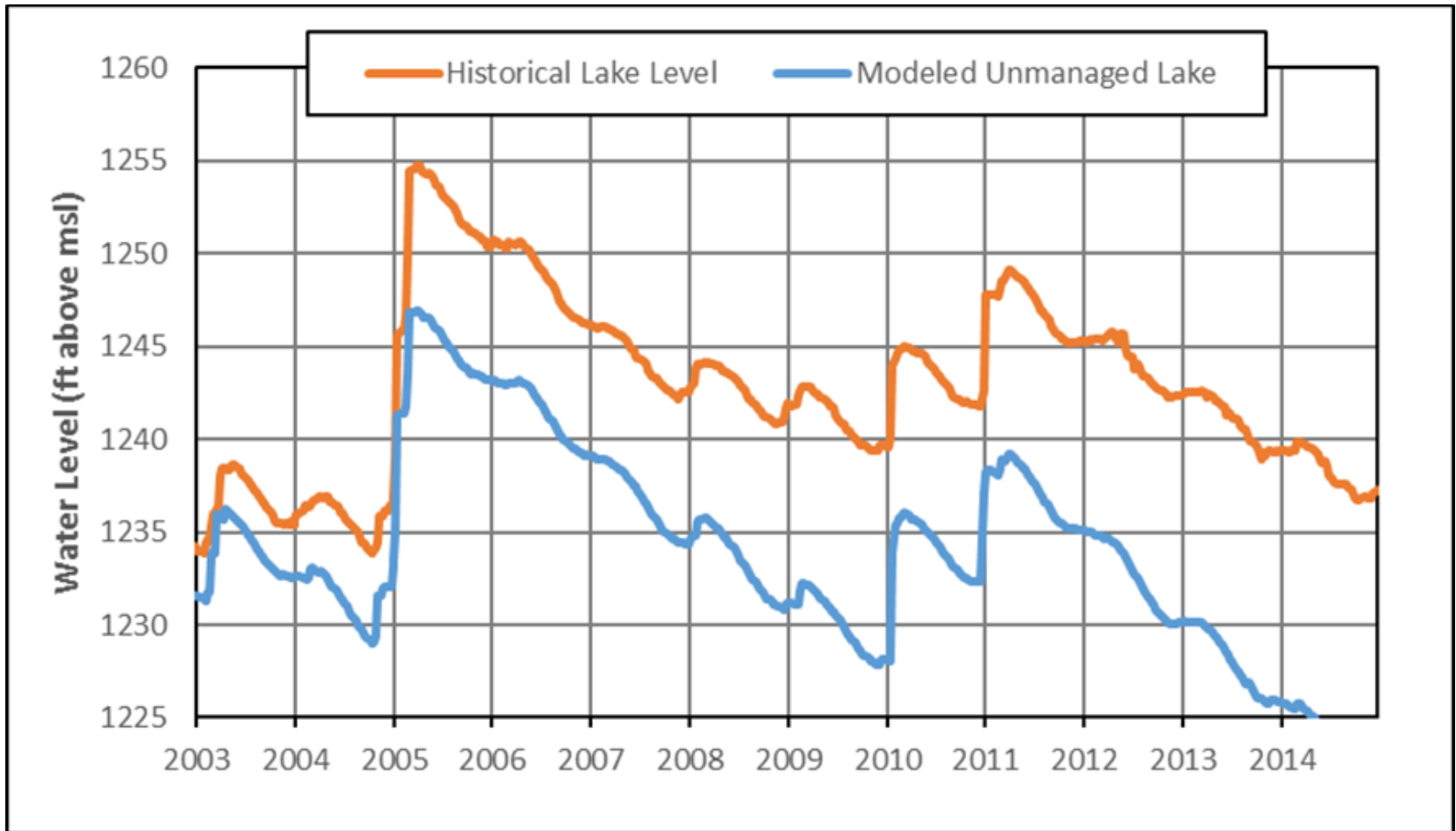


Lake Elsinore Levee Project (1996)

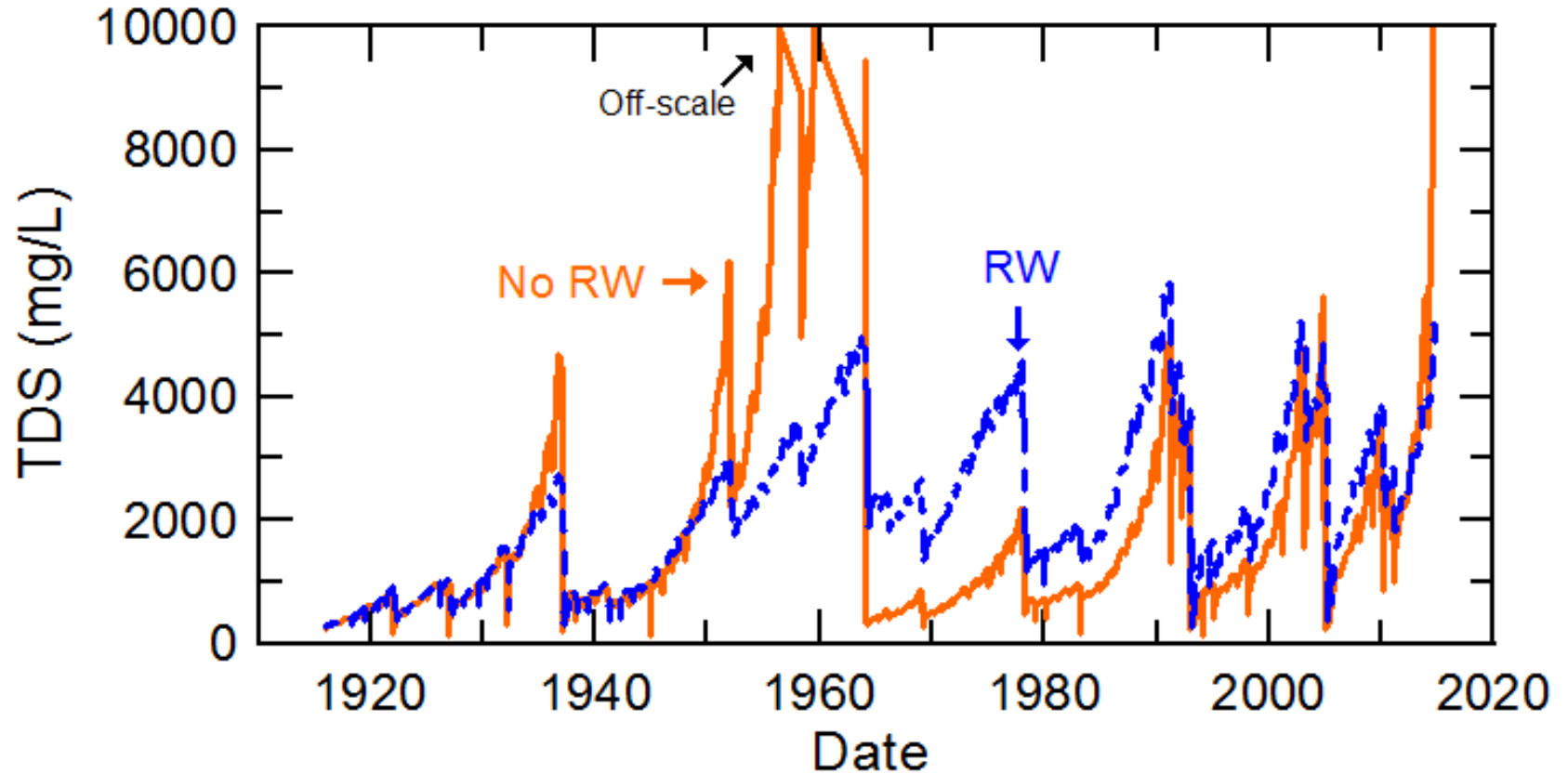


Reduce total lake area by 50% (from 6,000 acres to 3,000 acres)

Recycled Water in Lake Elsinore



TDS w/ & w/o Recycled Water



TDS w/ & w/o Recycled Water

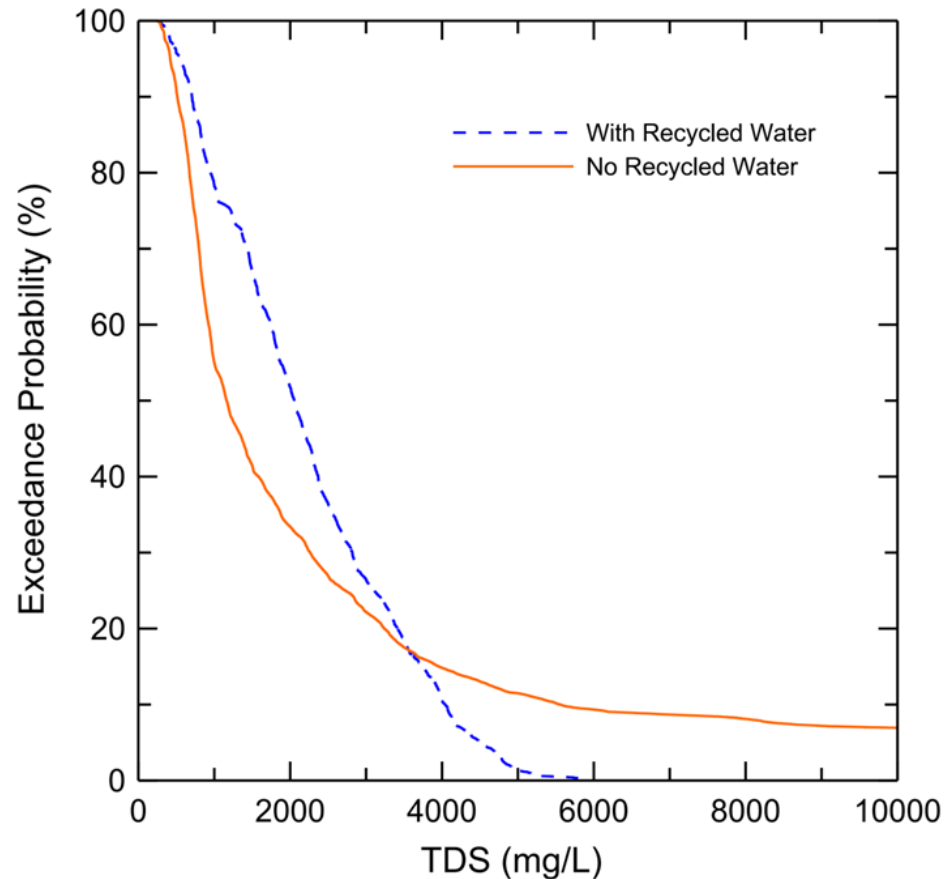
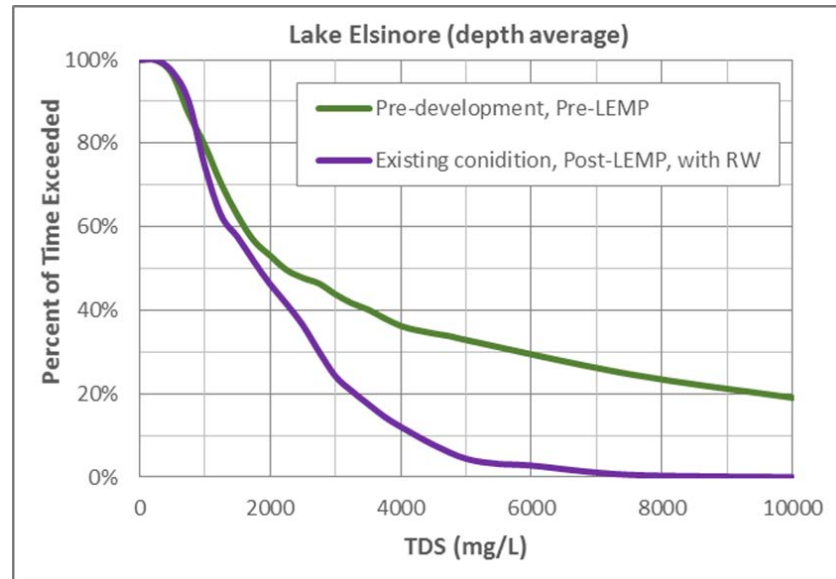
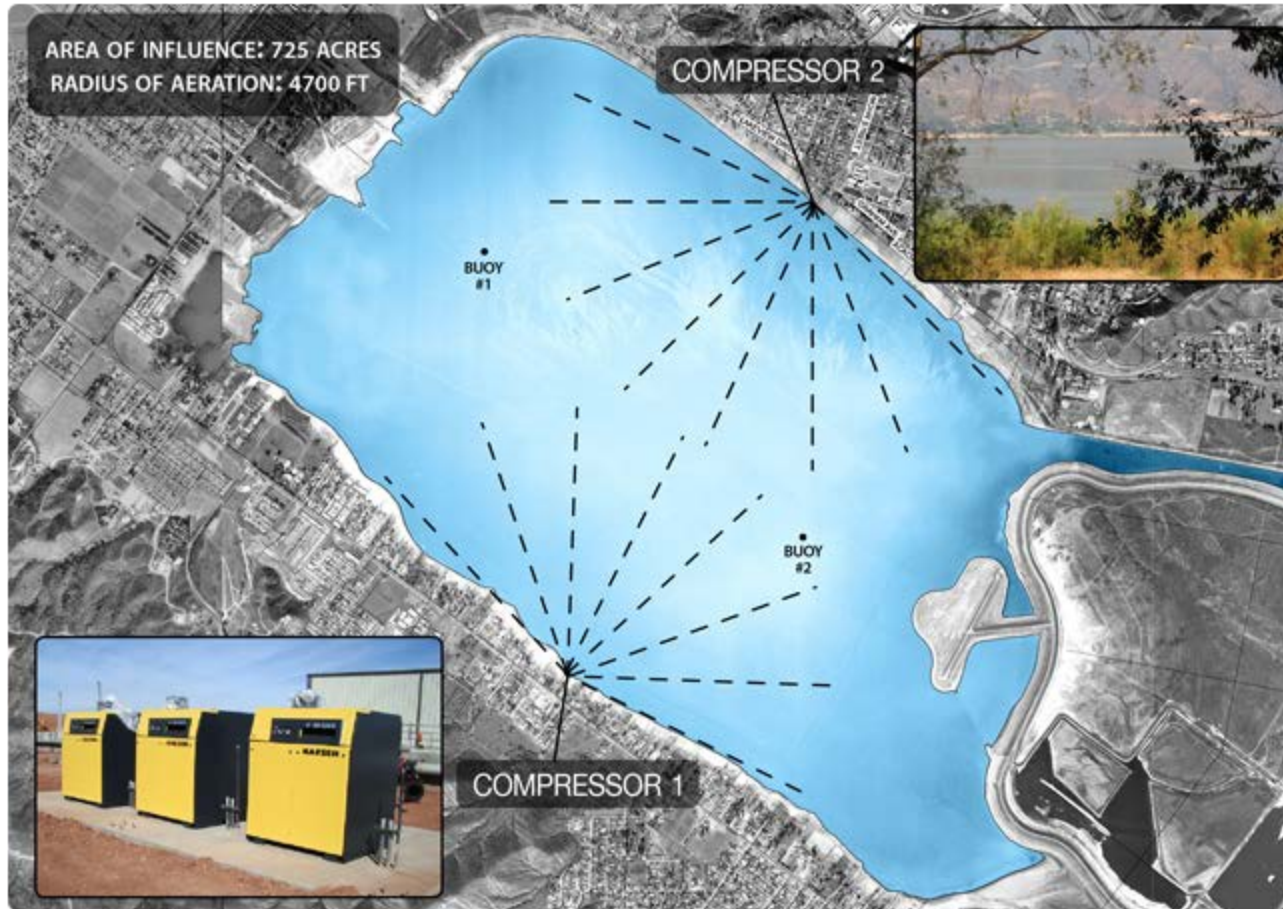


Fig. 6. Cumulative distribution function showing exceedance probability for TDS concentrations for the LEMP basin with natural flows (solid orange line) and inflows supplemented with recycled water (dashed blue line).

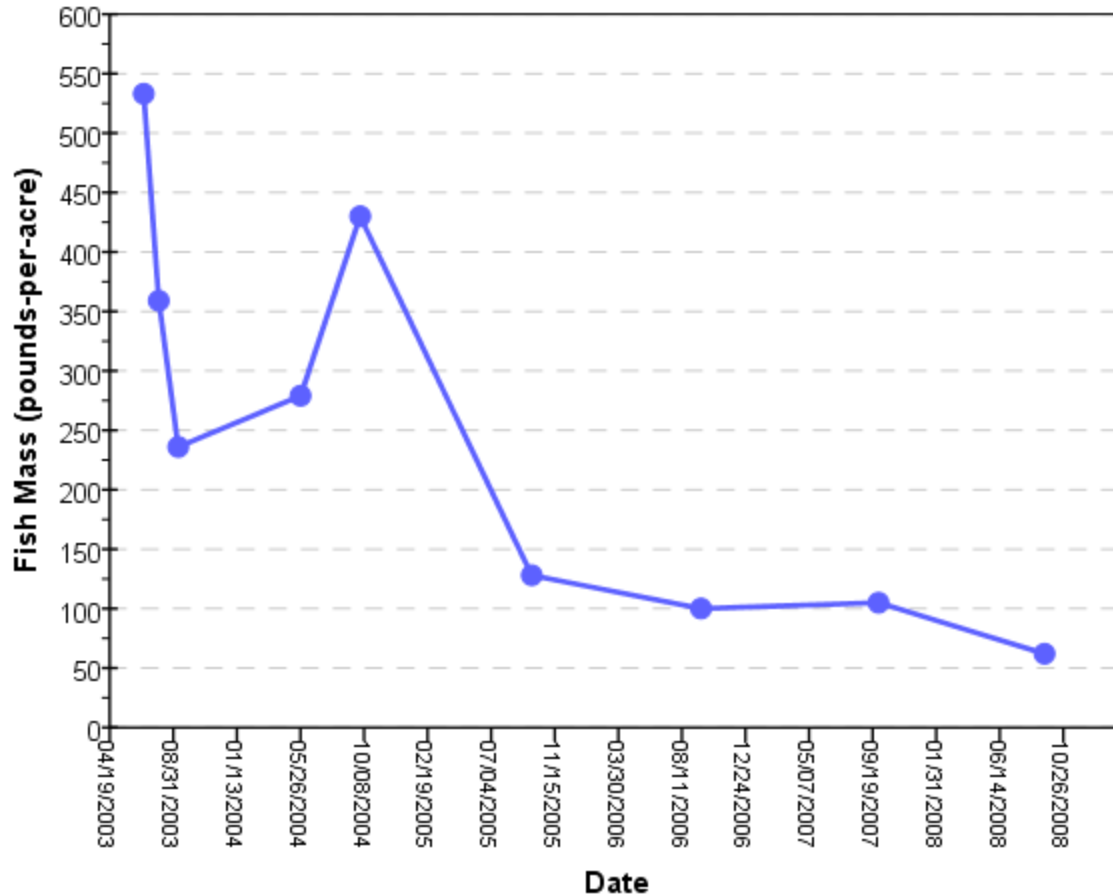


Lk. Elsinore Aeration & Mixing System

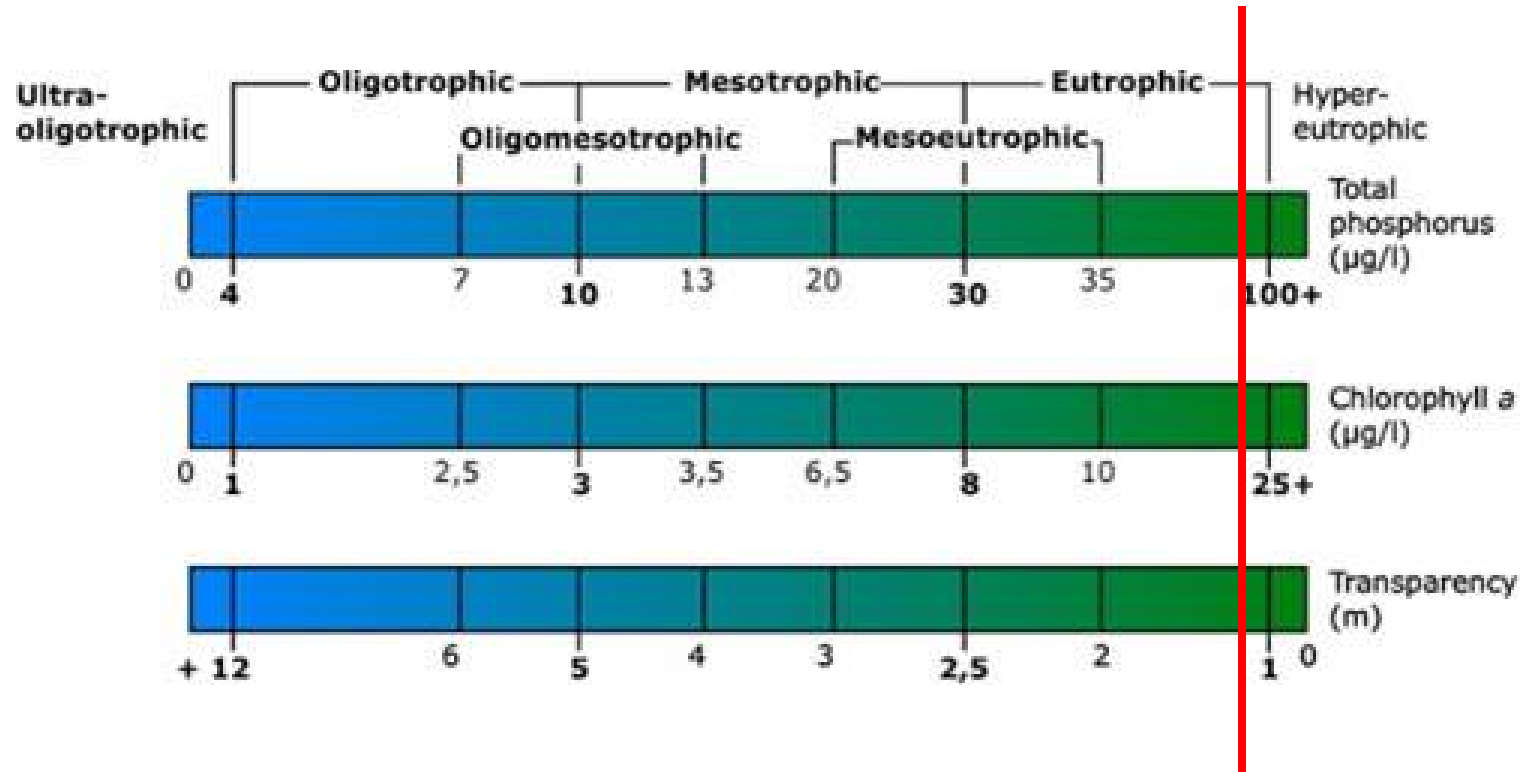


35% Reduction in Internal Phosphorus Loads from Lake Bottom Sediments

Carp Control in Lake Elsinore



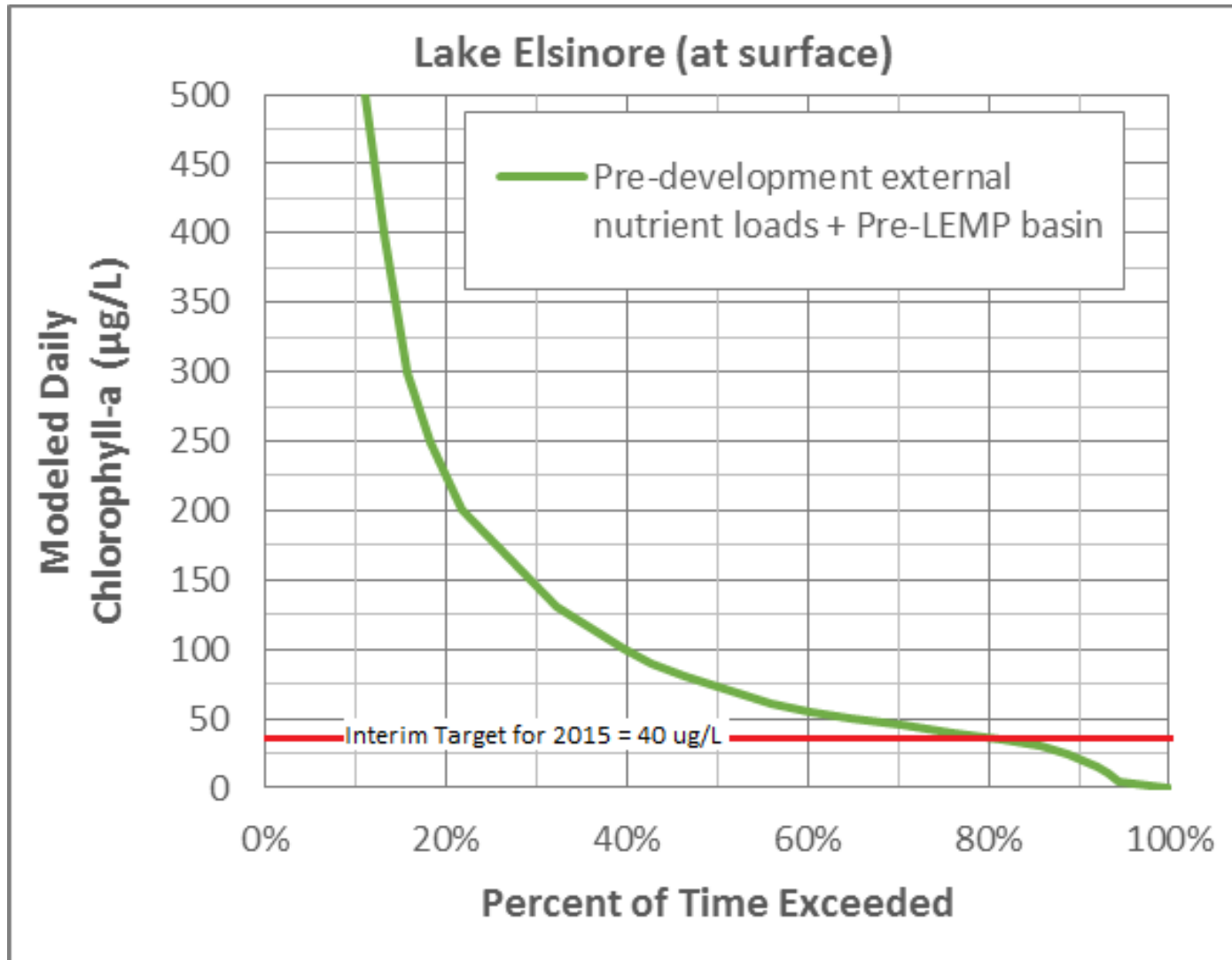
7% of Internal Nutrient Load Caused by Carp Bioturbation of Sediment



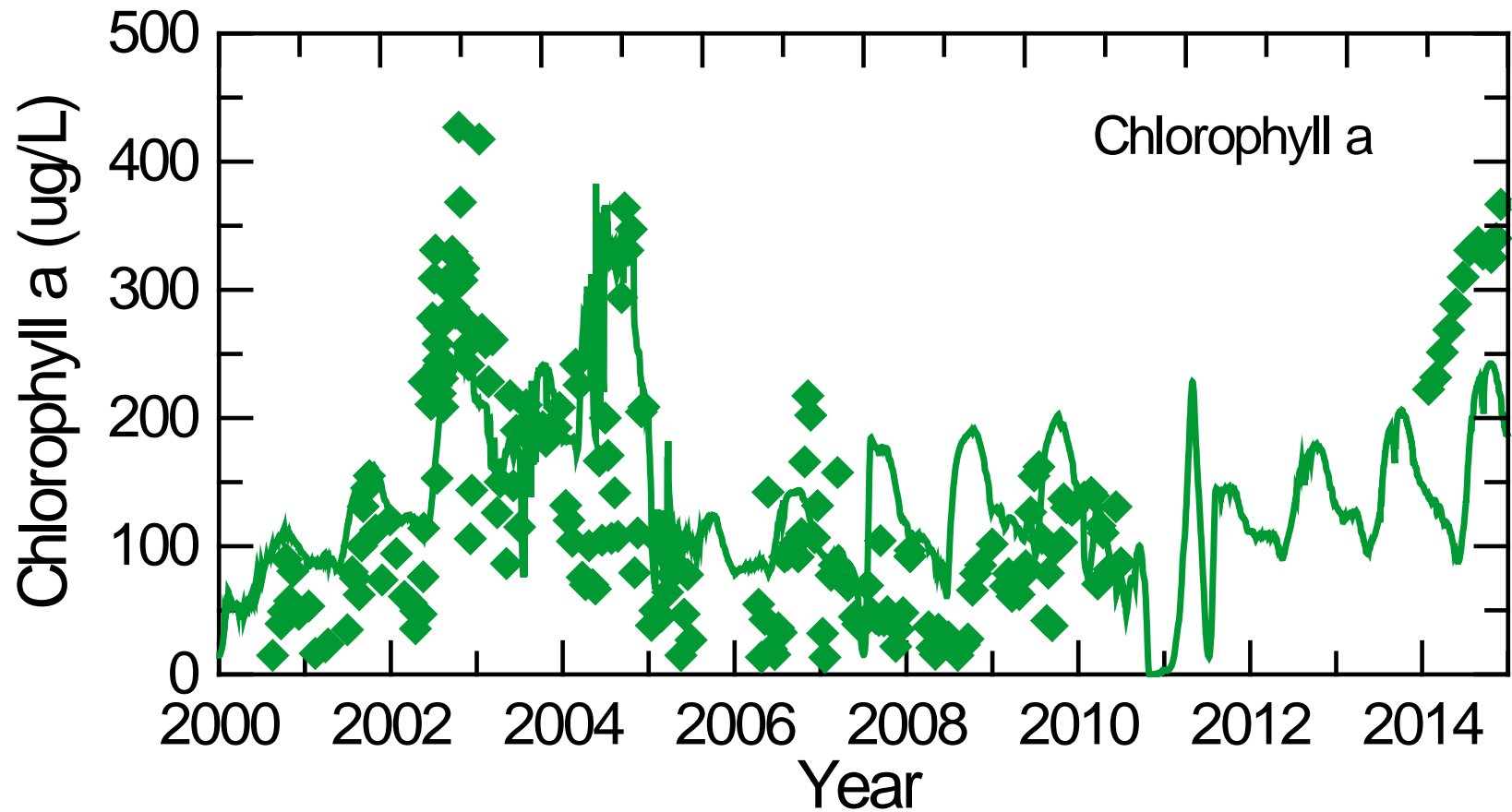
Trophic classification based on chlorophyll a, water clarity measurements, and total phosphorous values

Trophic class	Total phosphorous (µg/L)	Chlorophyll a (µg/L)	Clarity (m)
Oligotrophic	0 - 12	0 - 2.6	>8 - 4
Mesotrophic	12 - 24	2.6 - 20	4 - 2
Eutrophic	24 - 96	20 - 56	2 - 0.5
Hypereutrophic	96 - 384+	56 - 155+	0.5 - <0.25

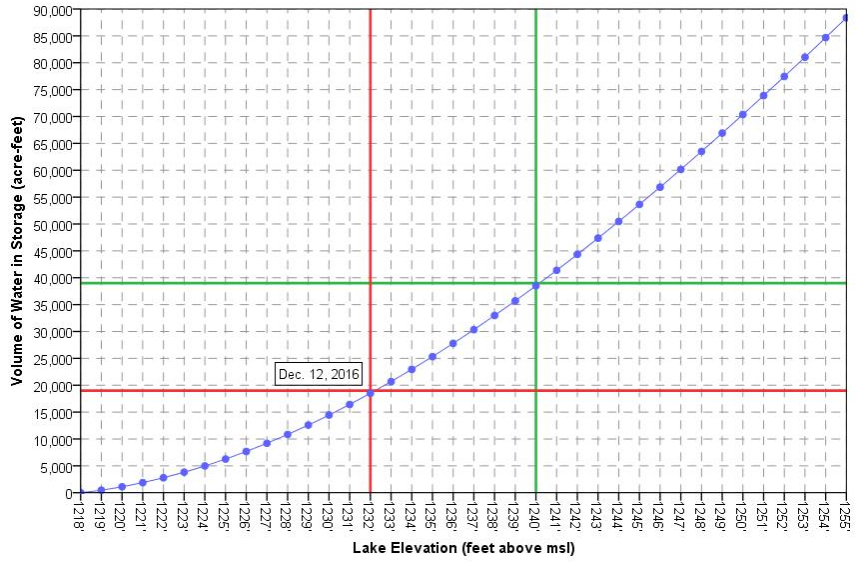
Lk. Elsinore Natural Reference Condition



Algae Trends in Lk. Elsinore

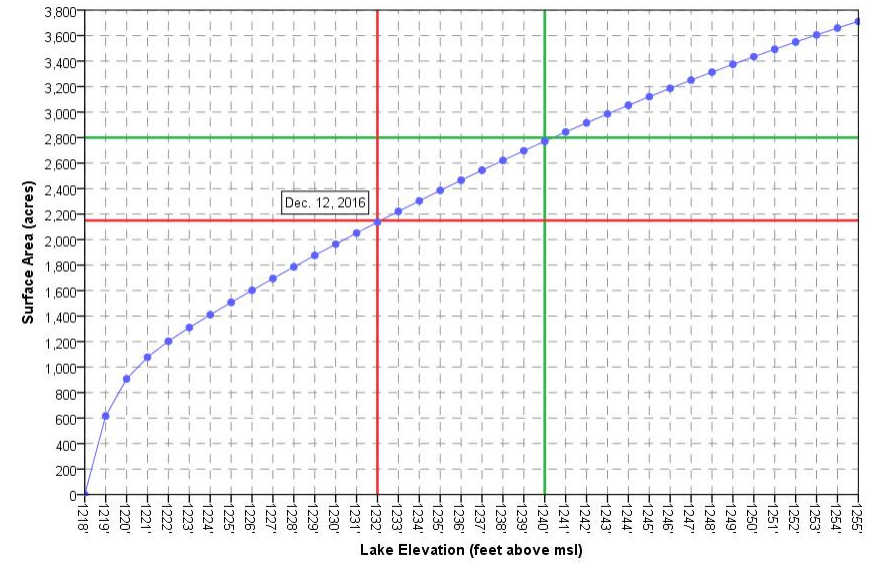


Lake Elsinoe



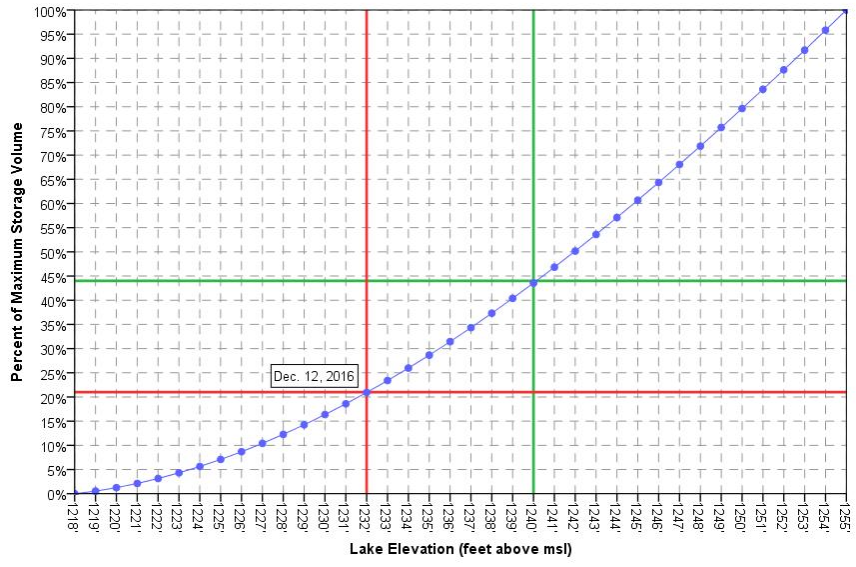
Storage Volume

Lake Elsinoe

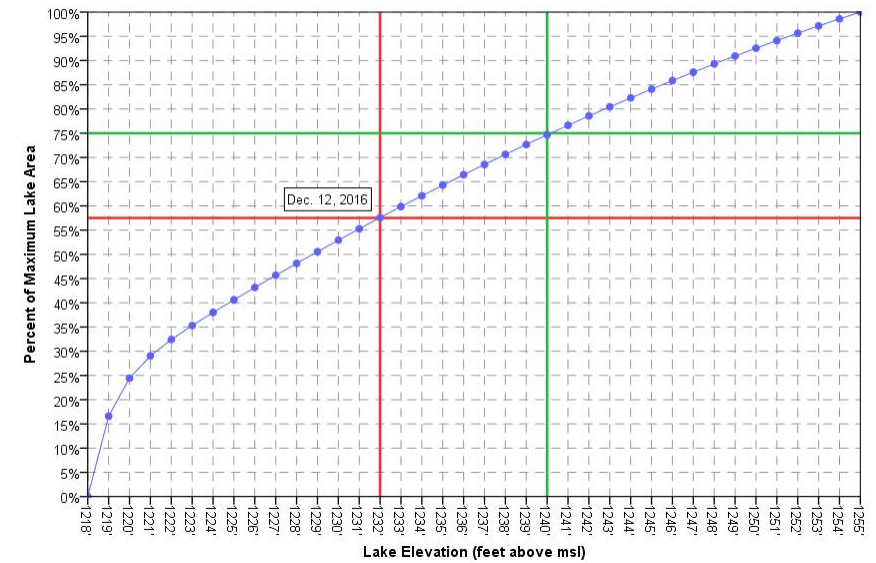


Surface Area

Lake Elsinoe



Lake Elsinoe



Lake Elsinore

- Terminal Lake in an area that receives $\approx 12''$ /yr. of average annual rainfall
- Evaporates $\approx 12,000$ acre-feet/year; loses $\approx 4'$ of depth annually
- On average, dries up completely every ≈ 40 -50 years; stays dry for ≈ 2 years
- TDS concentrations exceed 4,000 mg/L when lake falls below half full
- $\approx 85\%$ of total nutrient load comes from lake bottom sediments
- $\approx 90\%$ of external flows and nutrient loads arrive in just 3% of all days
- Lake is naturally hypereutrophic (>56 ug/L Chlorophyll-a) $\approx 60\%$ of the time
- Lake is naturally eutrophic (>10 ug/L Chlorophyll-a) $\approx 95\%$ of time
- Recycled water prevents lake from drying up completely; preserves uses
- Recycled water prevents TDS from exceeding 6,000 mg/L
- Aeration system reduced internal nutrient loads by $\approx 35\%$
- Carp control reduces internal nutrient loads by $\approx 5\%$
- Phosphorus concentrations in runoff near background levels last winter