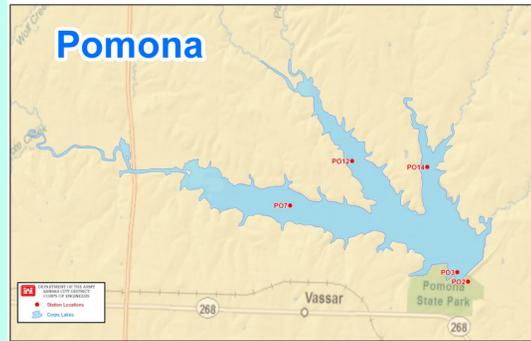


# Pomona Lake Water Quality Data

## 2003 - 2012



### Pomona Lake:

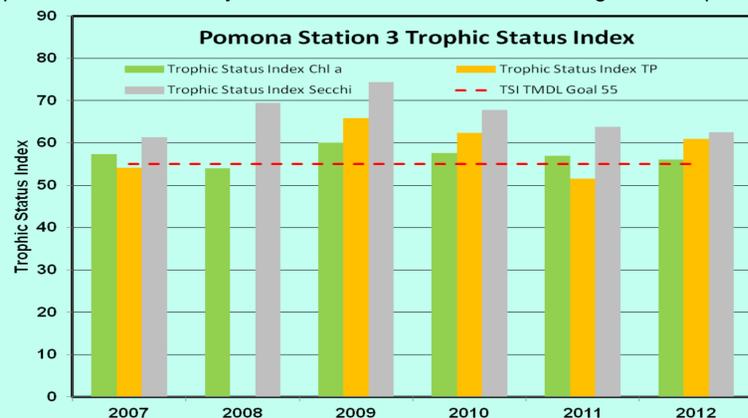
- Built on 110 Mile Creek reaching full pool in 1965.
- **Watershed** = 322 sq miles / 206,080 Surface Acres (SA)
- **Capacity:**
  - Flood Control: 176,123 Acre Feet (AF) / 8,522 SA
  - Multipurpose: 64,208 AF / 3,865 SA / 52 miles of shoreline
- **Operating project purposes:** flood control, water quality, recreation, fish and wildlife, and water supply.
- **Avg. annual inflow** (2003-2012)=144,575 AF, **2012 inflow** = 26,543 AF
- **Water Quality** at Pomona Lake in 2012 was beneficial to operating purposes listed above and did not exceed KS State WQ Standards for designated uses. Reduced inflows (-82%) resulted in decreased nutrient and sediment input in 2012.

The **US Army Corps of Engineers** (USACE) Water Quality Program collects monthly water samples at Pomona Lake\* from April through September. These figures present data collected between 2003-2012 from lake sites #3, 7, 12, 14, and the outflow (#2) below the dam. Thirty-four chemical, physical and biological parameters are measured to evaluate water quality. USACE uses this data to describe water quality history, conditions and changes from the inflow streams, within the main lake, and outflow focusing on eutrophication, nutrients, sediment, herbicides, metals, and contaminants.

\*Note: The term "lake" is substituted for technically correct "reservoir" throughout this document for consistency.

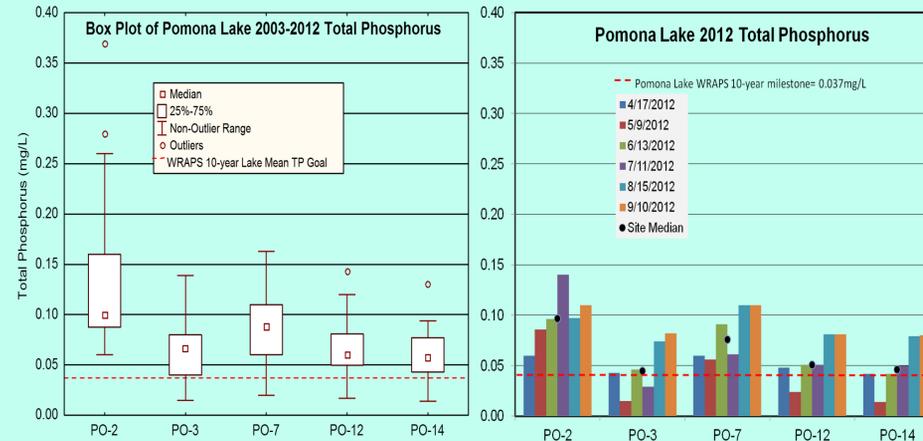
### Trophic Status Index

Trophic Status Index (TSI) is a calculation which can be based on average summer chlorophyll a, total phosphorous, or secchi measurements. TSI is used to describe the eutrophication process in numeric terms which is used to compare changes and effects over time. EPA has worked with water quality partners and Pomona Lake Watershed Restoration and Protective Strategy (WRAPS) group to develop total maximum daily loads (TMDL) for eutrophication and siltation to regulate nutrient enrichment to keep Pomona Lake water quality acceptable for recreational, aquatic life, drinking water, and industrial needs. TSI values of less than 55 is the goal. The figure below indicates chlorophyll a from algae and phosphorus meet or approach the goal while secchi values or water transparency needs the most improvement most likely due to influences from silt or inorganic components.



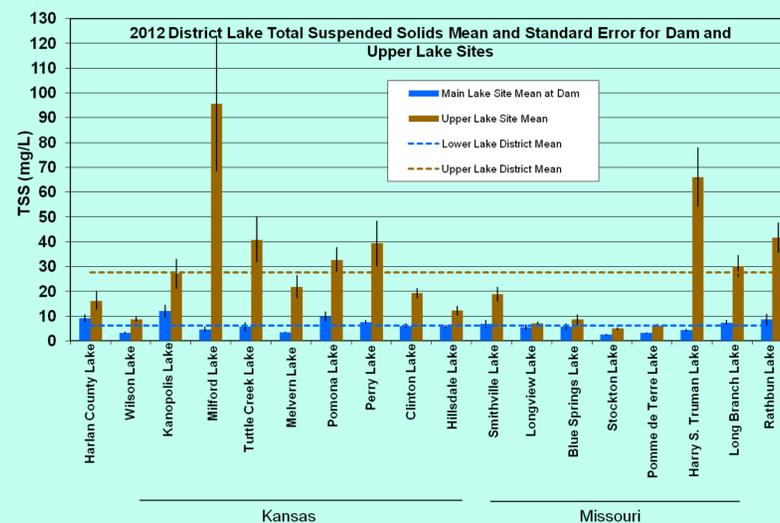
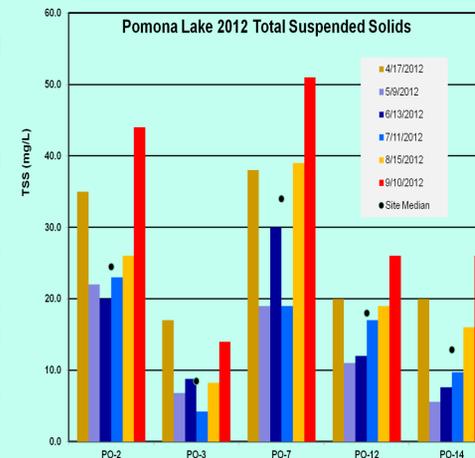
### Total Phosphorus

Total phosphorus (TP) median concentrations from 2012 Pomona Lake samples were lower than 2003-2012 medians at all sites. Mean TP concentrations was significantly lower ( $P < 0.05$ ) in 2012 at site PO-3 than 10-year TP mean and was near the 10-year milestone set by Pomona Lake WRAPS group. Median TP at all Pomona Lake sites are in the range of high biological productivity leading to high algae populations and rapid fish growth as indicated by eutrophic class designation. Similar to most impoundments, higher TP concentrations and a wider range of data is usually found in the upper lake sites and inflows due to mobilized nutrients bound to silt particles transported in moving water near the inflows and biological uptake or decline of TP as the water moves through the lake. Significant internal phosphorus loading was observed in 2012 as monthly TP values increased from May-September without significant inflow.



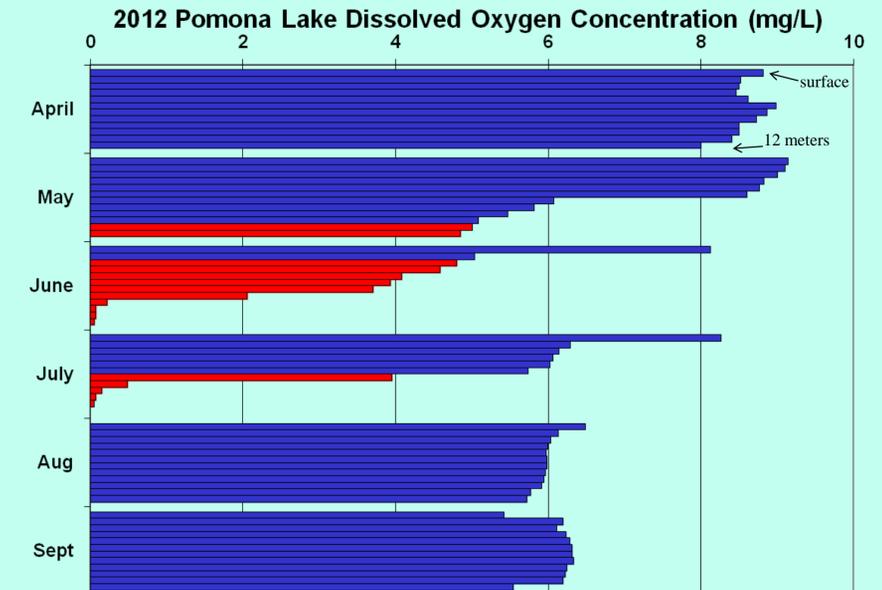
### Total Suspended Solids

Total Suspended Solids (TSS) is a good index used to describe erosion in river basins, sedimentation or filling rates of downstream reservoirs. TSS is also closely linked to nutrient and contaminant transport through river systems. Pomona Lake TSS values at the upper and lower sites were above average for District lakes with 69% of TSS settled out as water moved from the upper lake to the dam. Small particle size of sediments and short travel distance/time from inflows to dam influence TSS settling rate.



### Dissolved Oxygen

Dissolved oxygen is a key factor in aquatic species location, growth, and ultimately survival in lakes. Some lakes undergo a process called stratification or develop layers based on temperature and oxygen. This process begins in late spring, remains throughout the summer, and breaks apart (de-stratifies or 'turns over') in the fall. The figure below shows dissolved oxygen measured in the water column in one-meter intervals (e.g. each row in each month represents one meter of depth) from April through September. Pomona Lake stratifies for a short period of the summer, but adequate (5 mg/L) dissolved oxygen is typically available. The surface 2 meters of the lake was well oxygenated for fish and aquatic life throughout the summer in 2012. Reduced nutrients and siltation from watershed conservation efforts could help reduce biological oxygen demand and low dissolved oxygen periods caused from fluctuations in algae populations.



### Water Quality Concerns:

- Sediment inputs
- Eutrophication
- DO (shallow depth of stratification)



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