

Pomme de Terre Lake Water Quality Data

2001-2011

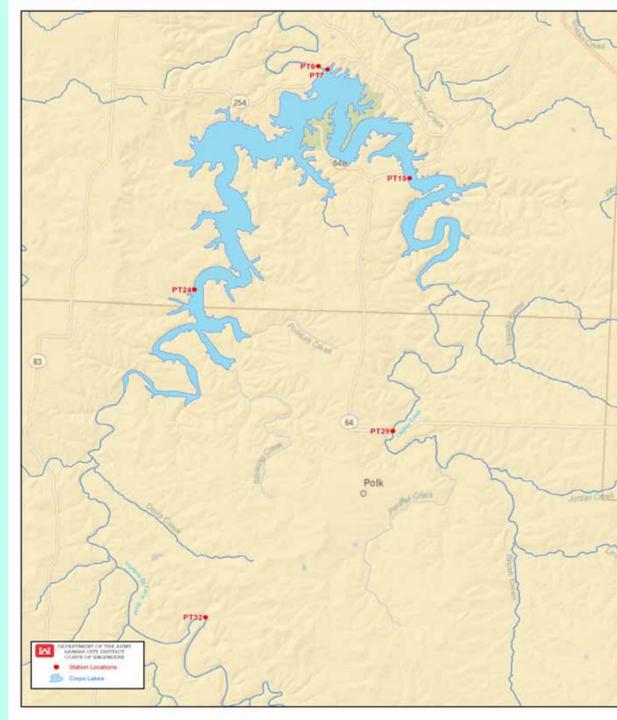
The **US Army Corps of Engineers** (COE) Water Quality Program collects monthly water samples (April – September) at Pomme de Terre Lake. These graphs present data collected between 2001-2011 from up to 6 sites. The sites include inflows (#29, 32), three lake sites (#7, 19, 24), and the outflow (#6). Thirty-four chemical, physical and biological parameters are measured to evaluate water quality. COE use this data to describe conditions and changes from the inflows through the lake and outflow focusing on eutrophication, nutrients, sediment, herbicides, metals, and contaminants.

Pomme de Terre Lake

- Built on Pomme de Terre River reaching multipurpose pool in 1960.
- Watershed = 611 square miles/ 391,040 Surface Acres (SA)
- Capacity:
 - Flood Control: 406,821 Acre-feet (AF) / 15,999 SA
 - Multipurpose: 237,356 AF / 7,790 SA / 113 miles of shoreline
 - Avg. annual inflow (1980-2011)= 459,500 AF/ 2011 inflow=525,400 AF
- Operating project purposes: flood control, water quality, recreation, fish and wildlife

Nutrient Enrichment

Nutrients (i.e. phosphorus and nitrogen) are essential for aquatic life and are the primary factor driving fish and aquatic plant growth rates and productivity. Excess nutrients from urban, agricultural or natural sources increases the natural aging or eutrophication process in lakes. This can alter plant and aquatic life in lakes and water bodies, cause algal blooms, create low dissolved oxygen affecting fish survival, and lead to taste and odor issues in drinking water. In 2011, Pomme de Terre Lake was below the District Lake average for total phosphorus (0.06 mg/L) and total nitrogen (1.0 mg/L) measured at the site nearest the dam. Average total phosphorus at the dam was near the EPA Ecoregion recommended criteria (0.024 mg/L) and at the high end or mesotrophic or moderate productivity. Mesotrophic lakes are characterized by moderate levels of nutrients and clear water (i.e. secchi measurement 2-4 meters) which provide good growing conditions for aquatic plants and algae which benefit the aquatic food chain including sportfish. Standard error bars in the graphs below illustrate the variation in nutrient sample results from each site in 2011.

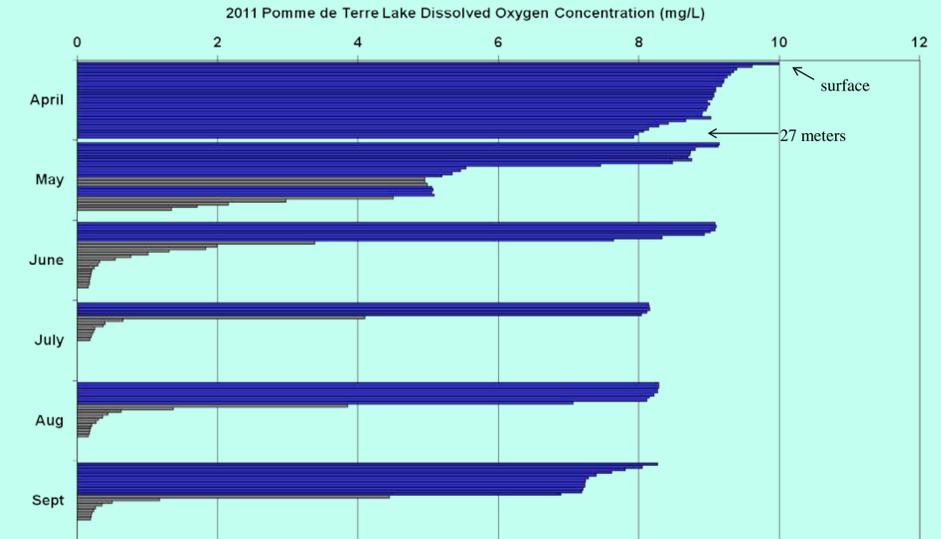


Total Phosphorus

Total phosphorus (TP) median concentrations from 2011 Pomme de Terre Lake samples were slightly higher than EPA Ecoregion recommended criteria (0.02 mg/L) at lake sites, however median TP from inflow sites were up to 3 times greater than lake levels. In 2011, TP values were similar to long term trends (2001-2011). In 2011, Pomme de Terre TP concentrations were similar to long term averages and trends with phosphorus concentrations highest in spring and fall months. 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 in moving water in inflows and biological uptake or decline of TP and settling as the water moves through the lake.

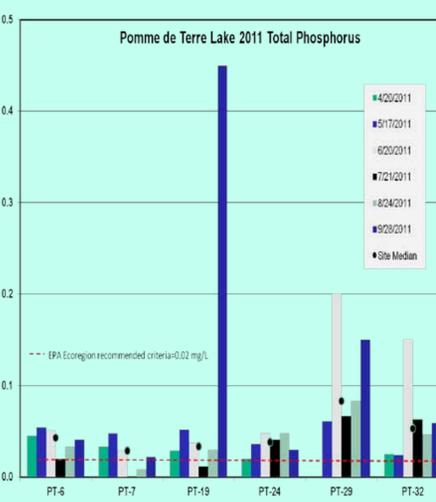
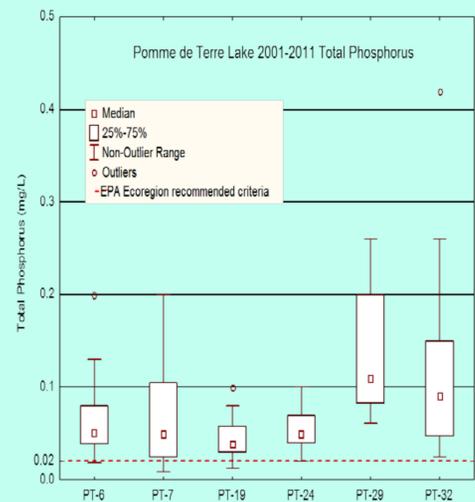
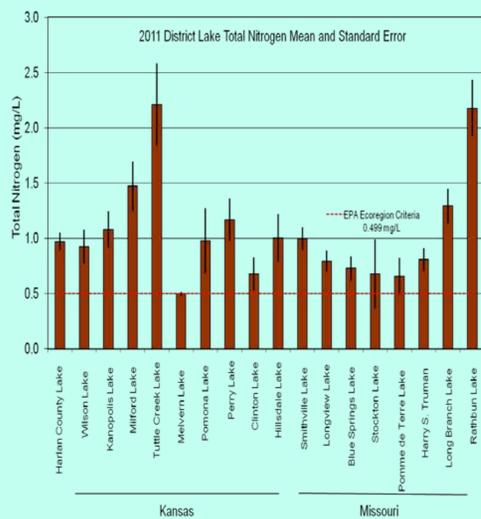
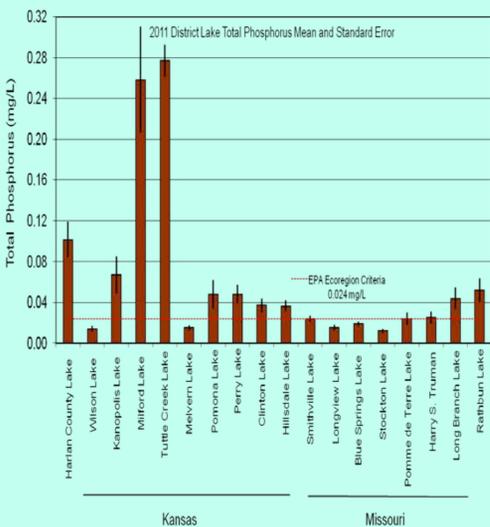
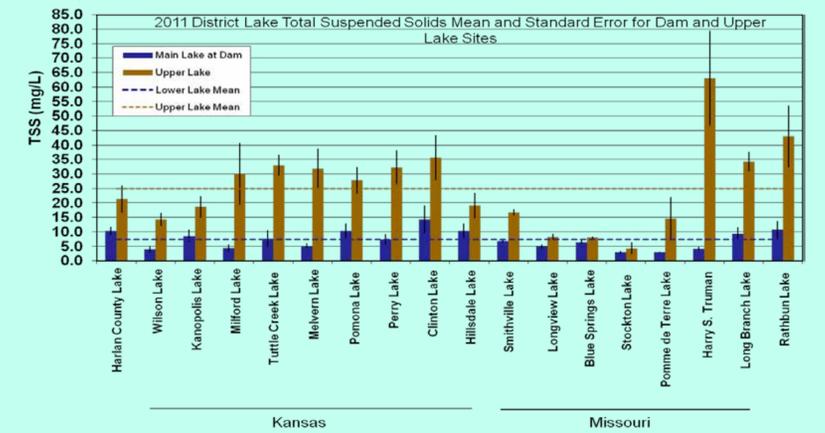
Dissolved Oxygen

Dissolved oxygen (D.O.) is an important 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 mixing the layers (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 at the dam (PT-6). Pomme de Terre Lake stratifies during the summer, however adequate (5 mg/L) dissolved oxygen is typically available in the lake. In 2011, Pomme de Terre Lake was oxygenated in the top 5 meters during the worst conditions in July.



Total Suspended Solids

Total suspended solids (TSS) or filterable solids in streams and lakes are a function of watershed characteristics including soil composition, land use, weather patterns, and characteristics of inflowing streams. Pomme de Terre Lake TSS values were below average for District lakes with 78% of TSS settled out as water moved from the upper lake to the dam. Low inflow TSS and the long distance from inflows to the dam benefit water quality at Pomme de Terre Lake.



Water Quality Concerns:

- Nutrients



US Army Corps of Engineers
Environmental Resources Section
Kansas City, MO