

The Water Line

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Generating Usable Data

Anyone who has taken a Secchi transparency reading will tell you, it isn't rocket science. So why do some state agencies object to data collected with volunteer help? Unlike the LMVP, many programs involving volunteers collecting water quality data (or other scientific data for that matter) are first and foremost public outreach efforts with educating the public about environmental concerns the main goal, and the generation of data a distant second. Data produced through volunteer efforts may be used for screening purposes, or they may be filed

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Watershed Group Planning Meetings Scheduled for Lake of the Ozarks

Two public meetings are scheduled to determine public interest in forming a watershed group at Lake of the Ozarks. DNR Public Information Specialist Victoria Lovejoy is organizing the meetings, which will be held on May 16 at the Osage Beach City Hall and May 22 at the Laurie Bank (Highway 5 and O intersection). Both meetings will start at 6:30 PM.

For more information, contact Victoria Lovejoy at:
(417) 891-4300 or
Victoria.lovejoy@dnr.mo.gov

2005 LMVP Data Reviews

Watch for LMVP 2005 Data Reviews in late March to mid April. The data reviews are informal meetings to discuss volunteer data collected during the previous year and to look at long term trends. With luck, the data report will be printed by then, and will be available at the meetings.

The Lake of the Ozarks meeting is scheduled for March 24 at 10:00am at the Lake of the Ozarks State Park office. The Table Rock meeting will be at the Ozarks Lake Country Senior Center at 10:00am on March 25. This weekend avoids shoreline cleanups scheduled for both lakes during the first weekend in April.

Also in the works are meetings in Kansas City and St. Louis. If you are in one of these areas, please let us know if you'd like a weekday or weekend data review session. We will try to accommodate the majority, time and location permitting. If you would like someone to come talk to your lake group specifically, please call or email using the contact information below.

We'll send out emails and postcards when those meeting dates become final.

Check for the most current time and location of the 2005 Data Review sessions in your area with the new LMVP calendar, at www.lmvp.org/calendar. You can also share your lake cleanup events, fishing tournaments, etc. by posting to the calendar. See page 4 for more about the calendar.

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LAKES OF MISSOURI VOLUNTEER PROGRAM

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US Army Corps Reservoirs

interesting facts from the Kansas City District

Steve Fischer, USACE—KC District

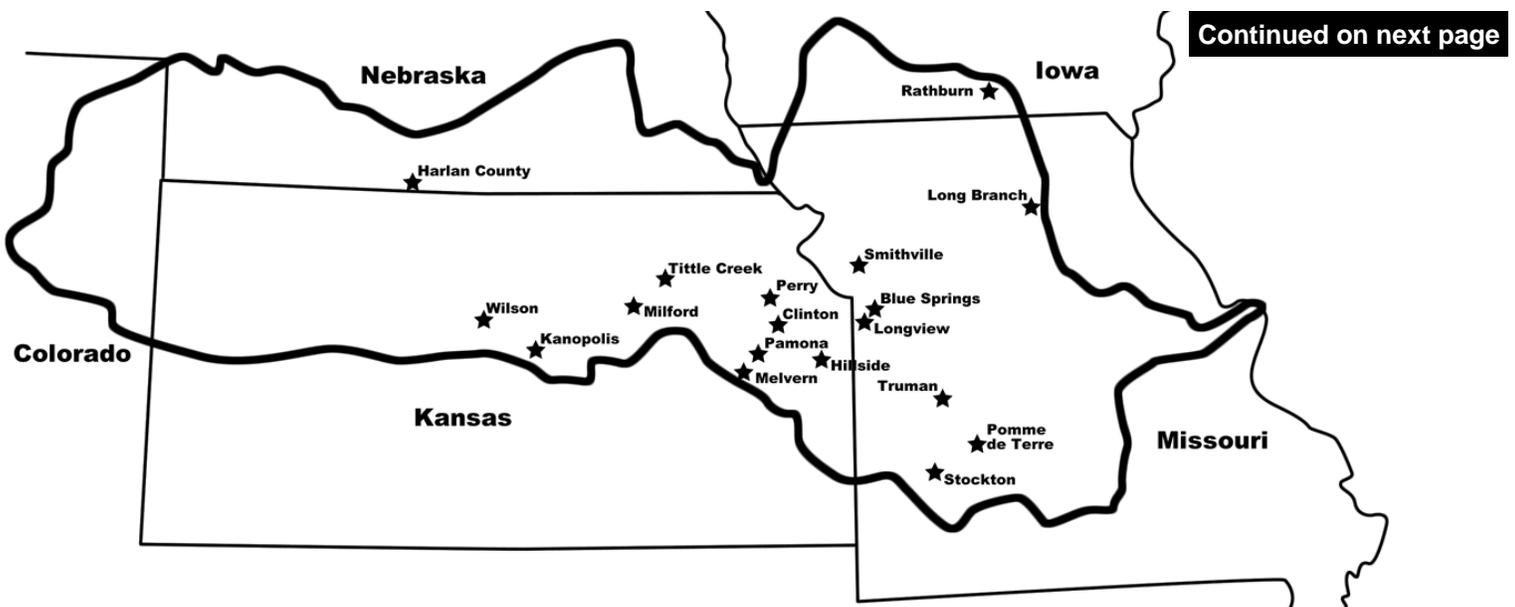
Most of us are familiar with the larger lakes in Missouri -- Harry S Truman, Smithville, Table Rock -- but what else do you know about them? Did you know there are five US Army Corps of Engineer Districts (Kansas City, St Louis, Little Rock, Memphis & Rock Island) that oversee most of these larger lakes? I'm sure your next question will be "why does it take five Corps Districts to cover the Show-Me State?" I have a very good answer – for Civil Works and Regulatory purposes, the Corps boundaries correspond to watersheds!

The Kansas City District is responsible for 7 lakes within Missouri – Stockton, Pomme de Terre, Harry S Truman, Long Branch, Smithville, Longview, and Blue Springs. In addition to these lakes, the Kansas City District is responsible for 9 lakes in Kansas (Hillsdale, Pomona, Melvern, Clinton, Perry, Tuttle Creek, Milford, Kanopolis, and Wilson); Harlan County Lake in Nebraska; and Rathburn Lake in Iowa (see the figure below). These lakes differ greatly in surface acreage (700 – 55,000 acres), watershed size (21,000 – 16,000,000 acres), age (20 – 60 years), flushing rate (0.2 – 2.4 years), water quality, fishing quality, and recreational use (see the Table on page 3).

The best water quality is associated with the Ozark border watersheds (Pomme de Terre and Stockton), but what is responsible for the measured differences between lakes?

The primary factor impacting water quality is land use within the watershed. The amount of pollutants (like sediments and nutrients) that are transported to lakes and streams via runoff is directly related to land use in the watershed. This has been discussed in prior issues of 'The Water Line', as well as the scientific literature (Jones et al. 2004). Geology is another factor, due to differences in rock and mineral composition as well as soil type.

Some differences in water quality between lakes can be explained by ecoregions. According to EPA, "Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable



Reservoirs in the US Army Corps of Engineers Kansas City District

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response to disturbance.” Some water quality standards and future nutrient criteria are set by ecoregions.

Now that we’ve discussed these factors, here is a trivia question for you to ponder (answer is listed at the end of the article) – “What is the clearest lake in Kansas?”

What are the immediate threats to water quality in these lakes? Sedimentation would be the single greatest threat because it reduces storage capacity, transports excess nutrients, and impacts recreational use / fishery. As mentioned, nutrients are a huge concern because they impact the overall productivity (eutrophication), increase the threat of blue green algae blooms, reduce depth of stratification and water clarity. Excess nutrients impact drinking water supplies (costs and availability), the fishery, and recreational use (aesthetics). Herbicides represent yet another water quality threat and this is primarily as a drinking water concern. Bacterial contamination is a

growing threat to both drinking water supplies as well as recreational use (boaters and swimmers).

To protect the water quality of these valuable aquatic resources, we need to develop active watershed partnerships. Such partnerships need to include all stakeholders – landowners, recreational interests, cities, counties, and state and federal agencies. For more information on US Army Corps of Engineers lakes within the Kansas City District, please visit <http://www.nwk.usace.army.mil/>.

References:

EPA. <http://www.epa.gov/wed/pages/ecoregions/ecoregions.htm>

Jones, J.R., M.F. Knowlton, D.V. Obrecht and E.A. Cook. 2004. Importance of landscape variables and morphology on nutrients in Missouri Reservoirs. *Can. J. Fish. Aquat. Sci.* 61: 1503-1512.

Answer: Wilson Lake. The watershed is dominated by grassland with very limited row crop farming or urban presence, and the geology is dominated by sandstone.

Missouri’s US Army Corps of Engineers Kansas City District Reservoirs

Lake	Year Impounded	Surface Area* (Acres)	Watershed size (Acres)	Hypothetical Flushing rate (yr)	TN µg/L	TP µg/L	TN:TP ratio	Chl a µg/L
Blue Springs	1986	722	20,992	0.54	553	36	15.4	16
Harry S Truman	1977	55,406	7,360,000	0.17	922	44	22.5	18
Long Branch	1976	2,429	69,760	0.42	863	52	16.6	18
Longview	1983	927	32,000	0.78	757	38	19.9	12
Smithville	1976	7,115	139,520	1.05	811	34	23.9	17
Pomme de Terre	1960	7,790	391,040	0.65	581	30	19.4	16
Stockton	1968	24,632	742,400	1.06	441	14	31.5	6

*Multipurpose pool elevation

Flushing rate: amount of time required to completely replace all lake water.

1 ft = 0.3 m

The failure of the Upper Taum Sauk Reservoir caused severe damage to Johnson Shut-Ins State Park. The DNR has organized a massive cleanup effort, and is posting pictures of the progress online . Visit the following address to view the pictures: <http://www.mostatoparks.com/jshutinsdamage.htm>

New Look for the LMVP Website

The look of the LMVP website has been updated to be a little less “busy” when compared to the old one. Aside from cosmetic changes, the website has moved to a better server (a server is the computer that physically houses the web pages and makes them available on the internet) and should load much quicker. Not only is the new server faster, it also allows increased interactivity.

Ultimately, I would like to allow visitors to create graphs and tables based on LMVP data. In the meantime, I have made a couple of additions to encourage your interaction with the website.

First, we now have a discussion forum, available at www.lmvp.org/forum.

If you have never used an online forum before, check ours out and click around to get comfortable with the process. Try to think of it as a bulletin board where you can tack notes for anyone to read. Somebody might tack a response to your note and eventually a discussion evolves. Right now there’s not much to read, but I’ll post some more things soon and hopefully some of you will chime in, too!

My hope is that people will chat about lakes, volunteer issues, or whatever else they want to at the forum. I also hope the forum will facilitate some interaction among the LMVP volunteers. I will check the forum daily to read and respond to new posts.

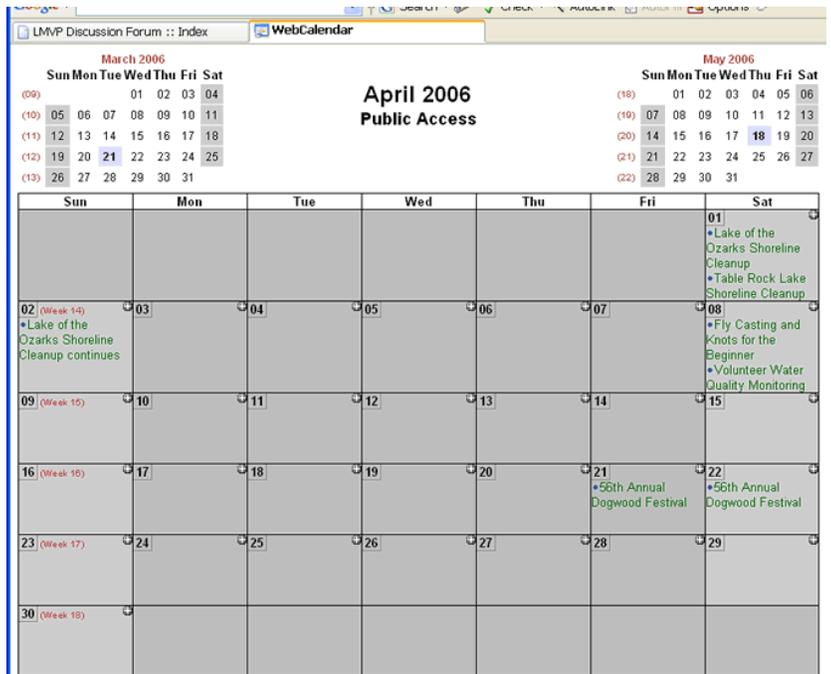
The other new interactive element at the website is the Lakes of Missouri online calendar. At www.lmvp.org/calendar you can enter any lake-related information you want to share with others. I initially pictured the calendar as a way to help me avoid conflicts as I schedule data re-



view sessions and lake visits. However, as I thought about it more, I realized that the calendar could be useful for anyone interested in Missouri lakes, lake cleanups, festivals, fishing tournaments, etc. I have posted a few things on the calendar, but the list is by no means complete. To post an event on the calendar, just click on the + icon for the day of your event and fill in the blanks. It’s easy!

The forum and the calendar are open to all, and you don’t need to register for either. However, if the forum or the calendar should fill up with automotive sales events and Viagra advertisements, I reserve the right to make registration a requirement. Hopefully it won’t come to that!

Tony Thorpe



The LMVP calendar at www.lmvp.org/calendar

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away and *never* used. This is especially true in situations where volunteers must use methods that lack the precision, accuracy and limit of detection that the agency requires.

The LMVP has different priorities. By design, our first two goals are collecting data to describe current water quality in Missouri's lakes and monitoring for long term trends. Educating the public about lake ecology and water quality issues is number three. Generating quality data for statewide use has always been the focus of the program.

Because the value of volunteer data is sometimes questioned, the LMVP staff strives to emphasize the quality of our data every chance we get. In 1998 we published a paper entitled *Evaluation of Data Generated from Lake Samples Collected by Volunteers* in the Journal of Lake and Reservoir Management. That paper compared data generated with volunteer help to data generated solely by the University of Missouri Limnology Laboratory. What we found was not sur-

prising (at least not to us!). The information collected with volunteer help was comparable to that collected by the University. A copy of this work can be found on the LMVP website (www.LMVP.org/documents.htm).

The LMVP staff is currently working on another review of the quality of volunteer data that we plan to present at the National Water Quality Monitoring conference in May. This conference will offer the opportunity to meet with other volunteer program coordinators and discuss issues, including how to foster the acceptance of volunteer data. We will share our thoughts on the conference and our findings in a future newsletter.

Changing perceptions about volunteer data can be an uphill battle, but as long as LMVP volunteers continue to put their time and effort into the collection and processing of lake samples, the LMVP staff will continue to fight for the acceptance of volunteer data. ☒

LMVP Website Statistics

The LMVP Website has undergone some changes recently (See page 4 for more details). A benefit of the update process is that I can now view detailed statistics regarding visits to the website. While none of the information I can get is personal or incriminating, it is informative. Here are some examples:

There have been 2600 visitors to the LMVP website in the first 20 days of February. That averages to 130 people per day. Of those 2600 visitors, 82 "bookmarked" the website. Meaning they'll probably come back again.

The majority of visitors come to the LMVP website via the search engine Google (88%), with a few coming from Yahoo (8%) or MSN (1%). The remainder arrive via other search engines or by direct links from other websites.

The vast majority of visitors come from the USA, but many come from Europe and Australia. We have had

5 or more people view our website from Brazil, China, Hong Kong, Japan, Malaysia, Singapore, South Africa and Turkey, to name a few. And we have had the occasional visitor from the Faroe Islands, Gibraltar, Guam, Indonesia, Portugal, and Syria, to name just a few more.

For perspective, in early 2004, we had 300 people a month visit www.lmvp.org. and by the end of the year that grew to about 1000. For all of 2005, that number didn't really change. However, since January the number of visitors per month has more than doubled! I appreciate the global attention that all of your hard work is attracting! ☒

The 8 most common phrases used to find the LMVP website via search engines (in order of frequency):

- | | |
|----------------------|------------------------|
| 1. Julian Day | 5. Little Dixie Lake |
| 2. Lakes in Missouri | 6. Liebig's Law |
| 3. Stockton Lake | 7. Lake Taneycomo |
| 4. Pomme de Terre | 8. Comparing box plots |