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| **Ozark Waters**  |

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| Volume XIII, Issue 03 |  January 21, 2019 |

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| **In This Issue** |
| [MO Lake Nutrient Criteria - A long time coming!](#LETTER.BLOCK8) |
| [900 Acres Forever Protected on the Shores of Bull Shoals Lake](#LETTER.BLOCK10) |
| [Hurst resigns from (MO) Clean Water Commission](#LETTER.BLOCK9) |
| [Long term ag change impacts stream water quality](#LETTER.BLOCK35) |

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| **MO Lake Nutrient Criteria - A long time coming!**David Casaletto, Ozarks Water Watch Executive Director When Table Rock Lake was placed on the 303(d) list of impaired waters for nutrients in 2002, DNR used narrative criteria, basically observation that water quality had declined. Numeric nutrient criteria establishes a specific level for phosphorous and nitrogen so when water quality testing data shows the lake has exceeded those values, it will then be considered impaired.algaeLakes in Missouri that are regulated by water quality standards are presumed to support at minimum the following uses: aquatic life protection, human health protection, whole body contact recreation and secondary contact recreation. A complicating factor in deriving appropriate lake numeric nutrient criteria is that, in Missouri lakes, which are almost all man-made impoundments, suitable conditions for supporting the various designated uses do not coincide, and are often at odds with each other. In particular, support of aquatic life protection (good fisheries) depends on a relatively high availability of nutrients to supply the food chain, while suitability of lake waters for whole body contact recreation (swimming) is favored by lower nutrient content.swimmingI first started attending Lake Nutrient Criteria stakeholder meetings back in 2005, and in 2009 Missouri submitted numeric criteria for lakes to EPA for review and approval. However, EPA concluded that Missouri had failed to demonstrate the criteria would protect the State's designated uses consistent with the Clean Water Act (CWA) and EPA's regulatory requirements and disapproved most of Missouri's criteria on August 16, 2011. After the disapproval, DNR had limited stakeholder interaction on lake numeric nutrient criteria but DNR staff continued to work internally with EPA to revise that disapproved criteria.https://files.constantcontact.com/4fc22b1a001/bd6be5f1-4b7e-4984-bbe8-5cd8b4eabf3f.jpgFinally, on January 4, 2018, the Clean Water Commission approved a revised Numeric Nutrient Criteria for Missouri Lakes and almost one year later, on December 14, 2018, [**EPA approved**](https://protect-us.mimecast.com/s/02BrC9r2ZzskkAKEUr_cXN?domain=r20.rs6.net) that revised criteria. Setting nutrient criteria is difficult because:1. Nutrients are naturally occurring, though human influences can increase levels in lakes and streams.
2. Phosphorus and nitrogen are required nutrients for all aquatic life (from the stand-point of the fishery, really low levels of nutrients are not optimal and there is benefit to aquatic life to having higher nutrient levels).
3. Phosphorus and nitrogen, in and of themselves, do not constitute an impairment. Instead they act as fertilizers for algae in the lake, which are the actual cause of impairments.
4. There is variation in the amount of algal growth that occurs due to the nutrients (two lakes can have the same nutrient levels but different algal chlorophyll levels due to other factors).
5. Impairments associated with algae do not always relate nicely to the amount of algae in the lake water (taste and odors problems or algal toxins relate to the type/species of algae in the lake and not the total amount of algae).

https://files.constantcontact.com/4fc22b1a001/161c6872-a467-4b00-973b-1ea72d394ad5.jpgThe approved plan lists about 35% of monitored Missouri lakes (34 lakes total) as impaired with about 33% needing additional evaluation to determine if there is an impairment or not. The estimated costs to permitted facilities under the [**approved plan**](https://protect-us.mimecast.com/s/4Qs5C0R9ZnIGGQWwUm7_1V?domain=r20.rs6.net) is $83 million. Of course, if additional lakes are included as impaired after the additional evaluation, that cost would go up.https://files.constantcontact.com/4fc22b1a001/2f6747db-5191-438e-a3b2-a53ee468f59c.jpgThe plan acknowledges that there is not a specific point in the nutrient/chlorophyll gradient where lakes become impaired. For the Ozark Highlands, the Missouri approach takes the view that lakes with chlorophyll levels between 6 and 15 micrograms per liter may or may not be impaired, and further evaluation should be conducted to determine if there is a problem/impairment. https://files.constantcontact.com/4fc22b1a001/d26d5ddb-5989-4bfb-a96c-97f56256c400.jpgAlso, lakes will only be listed as impaired if one of the "Eutrophication Impacts" (see chart above) have occurred. Although it took 15 years, Missouri now has Numeric Nutrient Criteria for Lakes! If you think that was fun, DNR can now start working on Numeric Nutrient Criteria for Streams! |

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| **Contact Info**OZARKS WATER WATCH                          MISSOURI OFFICE                                 ARKANSAS OFFICEDavid Casaletto, President                         PO Box 636, 11 Oak Drive                      1200 W. Walnut, Ste. 3405(417) 739-4100                                         Kimberling City, MO  65686                           Rogers, AR  72756contact@ozarkswaterwatch.org |

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